

The Jahangirnagar Review

Part II: Social Science, Vol. XLIV, 2020



**Journal of
The Faculty of Social Sciences
Jahangirnagar University**

The
Jahangirnagar Review
Part II: Social Science, Vol. XLIV, 2020

Editor
Rasheda Akhtar



Journal of
The Faculty of Social Sciences
Jahangirnagar University
Savar, Dhaka-1342
Bangladesh

The Jahangirnagar Review
Part II: Social Science
Vol. XLIV, 2020, Printed in June 2021
ISSN 1682-7422

Editorial Board

Members Al Masud Hasanuzzaman
 A K M Abul Kalam
 Khandaker M. A. Munim
 Md. Mizanur Rahman
 Mohammad Nasir Uddin
 Jebunnessa

Editor Rasheda Akhtar

Published by

Jahangirnagar University
Savar, Dhaka-1342, Bangladesh

Notes to Contributors

The Jahangirnagar Review is published annually in three parts: Part I: Physical and Mathematical Science, Part II: Social Science, and Part III: Humanities and Arts. The Jahangirnagar Review: Part II: Social Science invites articles, notes and book reviews on any subject relevant to Social Science.

Two complete hard copies (paper copies) plus a CD copy (in MS word) of the manuscript should be submitted. Papers must not cover more than 20 pages. Manuscripts should be typed on one side of the paper, double-spaced, with ample margins. The first page of a paper should bear the title of the contribution, the names(s) and the affiliations(s) of the all the contributors and full postal addresses together with the e-mail addresses (if any) of the corresponding authors. The second page should include the title, but exclude the authors' name to assist the blind review process. All articles should include an abstract of not more than 150 words. Main text should be followed by acknowledgements, footnotes and references. Excessive endnotes to the texts should be avoided.

Authors should supply clear copies of original artwork (figures) for illustrations, in a finished format suitable for reproduction. Please note that the editor will wish to reproduce illustrations at the smallest practical size that allows for ready interpretation by readers. Tables should be numbered consecutively.

References should be cited in the text by giving the surname(s) of the authors(s) followed by the date of publication for example, Jackson (1989) or (Hossain and Khan, 1992). The page numbers of all quotations should be included with the reference, for example, (Akhter et. al., 1993:14). Multiple references should be separated by semi-colons for example, (Chowdhury, 1990; Rahman, 1994). If two or more works of the same author in the same year are cited, the works should be distinguished by using the subscripts a, b, c, along with the year for example (Islam, 1991a, 1991b, 1991c). The details of all references should be listed according to the following form:

Books

Sarantakos, S. 1994. *Social Research*, London: Macmillan Press Ltd.

Journal articles

Muhuri, P.K. and Menken, J, 1997. Adverse effects of next birth, gender, and family composition on child survival in rural Bangladesh, *Population Studies*, 51:279-294.

Books (edited volume)

Ahsan, R. M. 1998. Migration pattern and process of female construction labour in Dhaka City, Bangladesh, in N. Islam (ed) *Recent Urban Studies, Bangladesh, A collection of USP research Papers*, PP. 113-133. Dhaka: USP.

Internet Journal Article

Schilling, J, 1999. Sustainable brownfield redevelopment, *Mayor's Asia Pacific Environmental Summit Proceedings*, U.S., Enterprise for The Environmental, <http://www.csis.org/e4e/Mayor43schilling.html>.retrieved on 22.09.2005.

Webpage

ABC NEWS. 2005. <http://medialit.med.se.edu/playingwithyourmind.information> retrieved on April 4, 2005.

Titles of journals should not be abbreviated. Articles are accepted for consideration on the understanding that they are not being submitted elsewhere. The editorial board is not responsible for the opinions and statements of the authors.

Address of correspondence

Editor
The Jahangirnagar Review: Social Science
Faculty of Social Sciences
Jahangirnagar University
Savar, Dhaka-1342, Bangladesh.
email: deansoci@juniv.edu

Price : Taka 300.00 (Outside Bangladesh: US\$ 5.00)

Printed by : Natundhara Printing Press
314/A Elephant Road, Dhaka, Phone: 01711 019696, 01911 294855

Contents

| | |
|--|-----|
| Shifting Masculinities: Everyday Gender Practices among Informal Sector Workers in Urban Dhaka | 1 |
| Farzana Islam Mohammad Nasir Uddin | |
| The Long-Run Perspective of Life Expectancy and Economic Growth in the South Asian Countries | 19 |
| Mala Rani Das Laila Haseen Tareq Imam Zahid | |
| Public Debt and Economic Growth in Bangladesh: Evidence from Granger Causality | 27 |
| Ayesha Siddika | |
| Internet Memes and Normalisation of Sexism in the Time of Covid-19 | 37 |
| Zobaida Nasreen Muhammad Ahsan Habib | |
| A Critical Discussion on Policy Practice on Gender-based Violence in Bangladesh | 51 |
| Sayema Khatun | |
| Gendered Communication and Women’s Vulnerability in Digital Media of Bangladesh | 65 |
| Md. Sayeed Al-Zaman | |
| Media and Child Marriage <i>Assessing its Role in Creating Awareness to Stop Child Marriage in Bangladesh</i> | 81 |
| Salma Sabiha | |
| Sidewalk and Traffic Intersections: An Urban Anthropological Evaluation of the Spatial Organization and Practices of Dhaka City | 93 |
| Kazi Ashraf Uddin | |
| Rural-Urban Migration and the Livelihood in Urban Area: The Case Study of Savar Upazila | 103 |
| Mohammad Safiqul Islam | |
| Profile of the Migrants from Bangladesh: A Comparative Analysis between Current and Returnee Migrants | 115 |
| Md. Riad Hassan Mohammad Amzad Hossain | |

| | |
|--|-----|
| Adaptive Strategy in Riverbank Erosion: A Study in Naria Upazila, Bangladesh | 137 |
| Abdul Kuddus | |
| Does Access to Safe Water and Improved Sanitation Facility Ensures Better Environmental Health Outcome? A Cross-sectional Study on Rural Bangladesh | 149 |
| Saima Ansar Jui | |
| Amin Masud Ali | |
| Environmental Health Analysis of Industrial Area: A Case Study on Urban Area, Khulna, Bangladesh | 169 |
| Tahsina Zarin | |
| Md. Tanvir Hossain | |
| Md. Nazmul Haque | |
| "Anxiety, coping and oscillation among Garo Ethnicity" Impact of COVID-19 on Urban Garo in Dhaka City | 185 |
| Nahin Ahmed Rini | |
| M. Sajjadur Rahman | |
| Rasheda Akhtar | |
| Survivors of COVID 19: Micro-ethnography of the Coronavirus Recovery Process | 197 |
| Akbar Hussain | |
| Predicating Land Use/Land Cover Changes for 2050 Using CA-Markov Model and LCM: A Case for Maheshkhali Island, Bangladesh | 213 |
| Tanjinul Hoque Mollah | |
| Munia Tahsin | |
| Nur Mohammad | |
| Md. Rakibul Hasan | |
| Naiem Mollah | |
| Water Policy Improvement and IWRM Implementation Effectiveness in Bangladesh | 227 |
| Ubaydur Rahaman Siddiki | |
| Planning Standards for Playground Facilities in Urban Areas: National and International Perspectives | 243 |
| Adil Mohammed Khan | |
| Building Vulnerability Assessment and Social Appraisal of Retrofit in Lalmatia, Dhaka | 263 |
| Mst. Tanzila Aktar Shawon | |
| Md. Akter Mahmud | |
| Mohammad Mizanur Rahman | |
| Michio Ubaura | |
| Open Space in Dhaka: Identifying the Factors of Public Inaccessibility | 283 |
| Fatima Kabir Sharna | |
| Halima Begum | |

| | |
|--|-----|
| A Planning Perspective on Fire Hazard Vulnerability of Shopping Centers in Dhaka City: A Case Study Base Approach | 297 |
| S. M. Nawshad Hossain Saiful Islam | |
| Possibilities of Creating Pocket Parks at High Density Residential Neighborhoods in Urban Area: Dhaka South City Corporation (DSCC) as a Case Study | 311 |
| Md. Ruhel Uddin Ummeh Saika Mohammad Ismail Hossain | |
| Predictive Assessment on Suitability of Isabgul Cultivation, Prospects and Challenges in Bangladesh | 325 |
| Md. Nazrul Islam | |
| Online Fertilizer Recommendation System (OFRS) in Bangladesh: Perspectives from the Field | 347 |
| Md. Mossabber Hossain Md Sazzadul Alam | |
| Incorporating E-governance to Civil Service Training of Bangladesh: Obstacles and Recommendations | 359 |
| Jebunnessa M. M. Ashaduzzaman Nour | |
| Community Participation as a Tool for Improving Municipal Service: A Study on Savar Paurashava | 373 |
| Muhammad Rashidul Hasan Ridoy Roy Sohag Ahmed Uswatun Mahera Khushi | |
| Evaluation of Local Government Performance to River Bank-Eroded People: A Case Study on Kachakata Union of Kurigram District | 387 |
| Farhana Akther Mst. Sharmin Akter | |
| Consolidating Democracy or Accelerating Development: A Comparative Study Between Bangladesh and Singapore | 399 |
| Kamrul Hasan Mohammad Tarikul Islam | |
| Social and Political Capital of People's Institutions in the National Election: The Case of Bangladesh | 417 |
| Hasibur Rahaman Md. Abu Saleh | |
| Using Social Media in Teaching and Learning in Government Colleges in Bangladesh: A Study on Cumilla Government Victoria College | 441 |
| Md. Raju Ahmed Muhammad Kamruzzaman | |
| Price for Quality in Vertically Differentiated Smartphone Markets | 455 |
| S. M. Ikhtiar Alam Mohammad Nazmul Islam | |

Shifting Masculinities: Everyday Gender Practices among Informal Sector Workers in Urban Dhaka

Farzana Islam*
Mohammad Nasir Uddin**

We are talking about characteristic elements of impulse, restraint, and tone; specifically, affective elements of consciousness and relationships: not feeling against thought, but thought as felt and feeling as thought: practical consciousness of a present kind, in a living and interrelating continuity.

(Raymond Williams explaining '*structure of feeling*' in Williams 1977: 132).

Introduction

Men in Bangladesh society, in general, have for long been habituated to consider women as dependent to them. One of the central pretexts that provide validation to such asymmetrical positioning is the ideology that men are the 'main bread-earners' and 'providers' of a family, and women's role is of submissive 'home maker'. It is important to enquire if this ideological tenet still holds its grip or has been dislocated. Similarly, important is to investigate the ways in which men and women connect or react to the changes in their roles and statuses. To unravel the transformation in gender ideologies and practices in contemporary Bangladesh, we assume that special attention needs to be given as to how the discourses of male dominance are shaped, contested, and reinforced in diverse contexts within Bangladesh society. Is it so that the 'provider' men find themselves at an unease to accept the transformation that unfolds as women gradually take up income earning activities in both formal and informal economic settings? How do men react to the 'crises' and 'tensions' that emanate from their role change? Is it adequate to view the attitude and action only in terms of reproduction and reinforcement of dominant patriarchal norms and values? How to account for the multiplicities of men's reactions?

On the other hand, as the 'constructionist perspective' stresses that masculinity is not only a physiological state but a 'social construction' within a particular culture (Fuller 1996), attention is generally given to the ways in which the (re)making of masculinity is connected to the workings of major social institutions such as marriage, family or household. However, as we argue here, exploration of social construction *per se* is not adequate to explain the fluidity of the ways in which affect, emotion, feeling, aspiration, prestige, dignity etc. come strongly into play in everyday life, and disrupt the simplistic and linear narratives as regards hegemonic power of institutions and ideologies. Also, the challenges and resistances that are posed to the dominant masculinities are not similar or

* Professor, Department of Anthropology, Jahangirnagar University (Currently, Vice Chancellor, Jahangirnagar University, Dhaka, Bangladesh).

** Professor, Department of Anthropology, Jahangirnagar University, Dhaka, Bangladesh.
Email: nasir@juniv.edu

uniform across classes, social contexts, and locations; even within same context, it is likely that emotions, affects and feelings would be formed, manifested, and practiced in diverse ways.

This write-up aims to go beyond the dominant narratives that focus mostly on structures and patterns of ‘classical patriarchy’ and shed light on the ‘legitimizing’ and ‘validating’ discourses of gender inequality. Not undermining the importance of discourses and patterns, what we try here is to illustrate the quotidian ways in which dominant ideologies, norms, feelings, and emotions relating to femininity and masculinity come to be contested, negotiated, reinforced, and subverted in the context of extensive dispossession, uncertainty and precarity. By putting more emphasis on bodily experience, affect and negotiation of power, we account for the fluidity and plurality that unfolds in the everyday life world. There are heterogenous ways in which diverse forms masculinities are experienced, subverted or reproduced by both men and women of impoverished households located in the margins of in urban and peri-urban Dhaka.

As we highlight the everyday forms of the gender understandings and feelings, we bring forward narratives as regards the deeper senses of insecurities that come to the fore in the context of precarity emanating from exclusionary social setting, unfavorable state policy and ‘adverse inclusion’ by the market forces. We highlight that the ways in which gendered practices come into play have strong connection to the diverse ways in which exclusion, exploitation and inequality work in a particular context. Our emphasis on plural, fragmented, and contested ways in which masculinity is molded and remolded in the lived realities is an attempt to make ways for questioning monolithic narratives that are dominant in terms of understanding gender norms, ideologies and practices.

A vignette: Contextualizing masculinity

Once Sohrab Ali was a rickshaw-puller; however, because of chronic illness he now has become severely infirmed. Most of the time he stays in his family’s one-room-home in a corner of a sprawling low-income settlement—popularly known as ‘*bastee*’—in older part of Dhaka city. For Sohrab, life generally is dull and doomed; however, since he depends fully on his wife’s income, he feels more exasperated. His friends and neighbors view him as a person of good spirit and talk positively about him. He shows sincere love and affection to his wife and family; in the past when he was the only earning member, he worked hard to provide for them and make them happy. Now he is particularly distressed with the ‘fact’ that his wife lately has started to behave rude to him. She returns home too late, and food is not cooked in time. Sometimes he finds the situation unbearable even though he helplessly tries to cope up. On the other hand, Rupali, his wife, does her ‘duties’ with as much sincerity as possible. She would be happier if she could stay home; however, as she has got no alternative, she works in a factory in the neighborhood to meet the bare necessities of life. She tries to make her husband feel comfortable amid extreme hardship. However, Rupali realizes that Sohrab is gradually becoming impatient. Inability to earn income and depreciation of health condition has affected his mental condition – she thinks. He is not willing to understand that Rupali cannot return from work at her will– the employers have their rules and restrictions. Sohrab’s comments about the nature of her job has led to fierce quarrels on a few occasions in recent time.

One evening, as Ruplai returned late from her work, Sohrab threw a piece of brick to her out of anger. He was hungry and because of her late return he remained unfed for long. Rupali was infuriated at Sohrab's behavior; however, she did not hit him back. It was not common for women in the slum to use physical force in reply to the hitting and beating unleashed by their men. The women would rather take recourse to verbal retaliation: trying to use quick-witted words to incite mental wound in exchange for physical attack. Teasing the man about his ability and action, reminding him as to how he owes a lot to her—that is, *khota deya* (reminding him about his weak points in a sarcastic manner)—is the practice that a woman generally opts for in such a situation.

Rupali did not ask Sohrab why he could not cook for himself; instead, she teased him by pointing out how he was helplessly dependent on her. She metaphorically reminded him that even though she was the only person to look after him, he had chosen to hurt her. She invoked a proverb: "*Biraler raag bera-r sathey*", that is, a cat can show its anger only to the fence. Like a fence she protects him by providing food and taking care, still he strikes her like a livid cat!

Rupali then directly pointed to the physical weakness and inability of Sohrab:

How can a man show so much of anger like a 'real man' when he stays at home like a woman? Is he not worse than a woman?

(*"Maiya mainsher moton ghore boiya thake je, tar abar purush polar moton goshwya kier? Se ki maiya manush thekeo kharap na?"*)

For Sohrab it was the biggest blow to his dignity and pride as a man. He was already deeply disappointed about the state of his life, and Rupali pointed the finger precisely to his grave weakness! He immediately stopped eating food and made the declaration: "If I am a true son of my father, I won't eat anything that comes with my wife's income". Sohrab then started to pull rickshaw again even though his physical condition was not suitable to do so. He decided to do the pulling half a day twice a week in a bid to earn enough to buy one *ruti* (hand-made bread) a day. This clearly was not adequate, particularly given his ill health; moreover, with the meager income, he was in no position to buy his medicines. His dignity was hurt, and he was punishing his body with an intention to chastise his wife.

Rupali could understand that Sohrab was trying to make an emotional statement as his self-esteem was badly wounded. She felt bad honestly. After all, he was not a bad husband. She asked for his forgiveness. "That day I was too tired as I returned home after long working hours. Then you threw me that brick piece; surely, I got crazy and said things that I should not have. I did not have senses as to what I was talking about" – she tried to explain and sincerely requested for apology. "You may punish me if you want. But please don't kill yourself" – she pleaded. Sohrab did not give a heed to Rupali's requests. She then made further requests via friends and children. Sohrab was approached even by their landlord who had known the couple for ten years. He ignored all requests and died within a couple of weeks.

Rupali's friends and relatives, who previously were sympathetic to her, suddenly started to blame her for the tragic end of Sohrab's life. Her rude way of reaction, choice of words, lack of patience, sudden harsh use of *khota* etc. are the things that came under much scrutiny. Questions were abundant: Was it because she was earning income that Rupali forgot her 'main' duty? Was she showing off her 'power' as an income earning woman? Should a woman undermine her responsibility as regards taking care of her husband and family? However, even though the friends and relatives apparently were castigating Rupali for her 'irresponsible' behavior, they knew that the situation in the family was really stressed – it was perhaps beyond anyone's capacity to be as patient as they were expecting Rupali to be. Sohrab Ali was suffering a lot, and his 'illusion' about life already came to an end (*jiboner maya kete geche*). He perhaps was looking for an excuse to abstain from food and medicine so that a quicker relief from long endured sufferings was possible.

The deliberations, chitchats and gossips that followed in the community revolved around the questions as to how extreme hardship in the households put men and women under stress in diverse ways, how life is cruel and unkind to poor people, how their emotions and sentiments are deeply aroused, and how the honor and dignity is affected and afflicted in the process. Friends and neighbors reflected on how people needed to go for 'desperate measures' to claim and reclaim their pride. As they wondered about Sohrab's anger and rage amid despairing circumstances, their reminiscence zeroed in on making sense of the pressures, insecurities, and wounds that the men in the community went through as they lost the 'control' of their family as the 'bread-earner' and 'provider'. The tone was more sympathetic to Sohrab Ali; however, it was not difficult to hear men and women talking in compassionate ways about the plight of Rupali's life too. The interlocutions were replete with the annotations as to how both Sohrab and Rupali were prey to deep afflictions and sufferings that awakened their intense emotions. Material impoverishment and hardship were at the core of the crises; however, there were more at play: a person's senses and feelings as regards hope and aspiration, dignity and pride, endurance and suffering – all were affected by the strains emanating from the grievous course of life.

The 'explanations' weighed in by the community people clearly drew attention to how framing the experiences of Sohrab and Rupali only in terms of the structure of 'male dominance' or 'female subordination' would be inadequate. It is not merely about being 'victim' or 'perpetrator' of some fixed system or structure – focusing on the way in which a person's socially located subjectivity come to be formed, expressed or performed is important to grasp the messy reality and the behavior that unfold onto it. Since emotion, affect, disposition, and temper evidently act as important constituents of an actor's doings, there needs to be more focus on how the practices are embedded in the everyday lifeworld rather than being located entirely in the generic structures and patterns. This resonates much of what Raymond Williams termed as 'structures of feelings': affective elements of consciousness and relationships in the present forms (Williams 1977).

As it is epitomized by the story of Sohrab and Rupali, this write-up intends to ethnographically delineate the 'social situatedness' of gender relations and practices in general and intends to go beyond the 'deterministic explanation' that overstates how dominant 'systems' and 'discourses' give way to forms of masculinities and femininities.

In what follows, we first briefly discuss the ‘background’ and ‘aim’ of the write-up and then we provide a ‘conceptual framework’ of our position. Then we shed light on the methodology that we employed while gathering the ‘data’ that we recount here. In a bid to elucidate how masculinity and femineity is dominantly ‘constructed’ in Bangladesh, we then focus on some aspects of ‘socialization’ and focus particularly on how the dominant ideology of ‘responsible male’ or ‘man the provider’ is passed on and reinforced intergenerationally. It is shown that socialization contains elements that provide with ‘enabling logics’ to exercise authority and power over those women who they ‘provide for’. In the next section, we examine the responses of both men and women to the transformation that the relations and practices undergo as women engage in wage work. Further on, we highlight the complexity of the ways in which men react to highlight that the responses or reactions of men are not homogenous or linear. While exploring women’s response to the ways in which men conduct themselves, we stress the dynamics of power relations that is shaped up from beyond household and delineate the ways in which women particularly take recourse to verbal resistance and make use of *khota* and other verbal expressions. In conclusion, we highlight how the widespread precarity creates the ground for men and women to act and react in diverse ways.

Conceptual framework

Connell’s theoretical concept of ‘hegemonic masculinity’ (Connell, 1995) has been identified as ‘the single most influential, recognized and utilized contribution’ to masculinity research (Christensen and Jensen 2014). The concept has played a significant role in studies of men and masculinity (Hearn 2004; Messerschmidt 2010). As Connell argues, hegemonic masculinity refers to those ideas and practices that are perceived as ideal for all men (Connell 1998: 5). Those ideals and practices have two key features: a belief of male superiority and dominance in relation to women; and, privileging of heteronormativity that structures relations between men and women, as well as among men. However, what is important to note is that not all men are able to achieve those ideals. Connell’s discussion showed variation among men and illustrated that not all men equally enjoy the privileges that are offered by patriarchal social norms. As we have seen in our studies, men in the marginal economic conditions may have a very limited possibility to exert any kind of dominance towards both women and men in the greater society even when they may hold power over women in their own family or community. However, as we have already noted above, in case of Sohrab and Rupali, such ‘incapacity’ of a man may bring about affective crises with far-reaching consequences.

However, Connell’s initial conceptualization of hegemonic masculinity faced strong criticism from the various academic fronts. Wedgwood (2007) has argued that three key elements of Connell’s theory of masculinity have been largely neglected by other scholars: the crucial influence of psychoanalysis and subsequent use of the life history case study method; the importance of non-hegemonic forms of masculinity; and the concept of cathexis. As we see in the vignette about, cathexis—or emotional and affective aspect of gender relation—is a significant constituent of a person’s subjectivity.

'Cathexis', in Connell's terms, refers to the structure that constrains and so shapes people's emotional attachments to each other. It refers both to the hegemonic 'limits' placed on practices that constitute emotionally charged social relationships in which the bodily dimension features and to the social practices which challenge such hegemony (Maharj 1995).

We argue here that the concept of 'cathexis' or emotional attachment deserves to have increase attention. Our exploration shows that the enforcement of hegemony – and challenges to that – can be grasped in full if you take the 'emotionally charged' ways of behaviour into account.

Another response to Connell's theory of 'hegemonic masculinity' has been the argument that masculinities have to be connected to the concept of intersectionality: 'intersectional approach may offer a theoretical tool for analyzing the complexities of differences and hierarchic power relations between men' (Christensen and Jensen 2014: 60). We make points here to support this argument. The cases and life histories that we present show that while everyday practices as regards gender-relations significantly draw on hegemonic ideologies and discursive formations, it is important to recognize how the associated ideologies (such as those of femininities and masculinities) come to be shaped and practiced in diverse ways according to socio-cultural settings as well as over time. Along with materiality of what is meant by being 'woman' and 'man', it is important to shed light on how 'spatiality' and 'temporality' shape ways for an individual to act as a 'person' and 'subject'.

Moreover, examination of intersectionality of diverse asymmetrical social processes is important: a human subject's gendered identity is interwoven with other identities and positionalities that are formed in socially situated ways. Intersectionality also recognizes how distinctive situatedness of social agents influence the ways they affect and are affected by diverse social, economic, and political processes.

Yuval-Davis (2011) has argued that belonging and the politics of belonging are located in the intersection of the sociology of power and the sociology of emotion. This observation might be extended and linked to Connell's concept of 'cathexis' to make sense affect comes into play with regards to masculinities. It is important to understand the forces and processes that lie behind aggressive or hegemonic masculinity. If anger, grief or violence are dominant constituents of masculinity that come to be expressed in certain contexts, then it needs to be asked: How was it so that the particular emotion was shaped and expressed in the particular context and in the specific way?

Another dominant way to view masculinity is to focus on the working of patriarchy. From this perspective, much weightage is given to the 'gender role' that patriarchal ideologies offer to a man. Salisbury and Jackson (1996) have raised questions about this 'gender role' model as they have noted,

All this talk of 'internalizing dominant stereotypes' doesn't give any critical purchase on questions of boys' resistance, the variety of masculine forms, historical changes and the contradictions in the lives of most boys and men. It does not analyze boys and masculinities in such a way that allows them to accept active responsibility for their own changes. Viewing boys as passive 'victims of gender socialization', where boys just slot into a sexist

role or script, doesn't do justice to the complicated dynamic of boys' struggles and resistances in the processes of becoming masculine.

Kalle Berggren (2014) proposes to view masculinity as 'sticky'. He draws in particular on Sara Ahmed's innovative combination of poststructuralism and phenomenology (Ahmed 2004; 2006). By qualifying masculinity as 'sticky' the suggestion made here is to recognize that boys/men are positioned as 'gendered oppressors' in contradictory processes and, also that there is lived experience behind the taking up of particular cultural norms of masculinity by the actors; the path of transformation involves both contesting oppressive gender practices and "[b]roadening out boys' feelings range" (Salisbury and Jackson 1996: 221).

Masculinity shapes the bodies it encounters as "men"; it impresses on them, directs, and orients them. But at the same time, masculinity is not the only "discourse" positioning "men," and so "there is a conflict between the fiction of a fixed, 'real me', masculine self, and more fluid, alternative selves" (Salisbury and Jackson 1996, 7). While there is flexibility and contradiction, this does not leave subjects unattached; the circulation of norms sticks to bodies, and the more masculinity is performed, the stickier it becomes.

Berggren (2014) thus argues that thinking about men's subjectivity by focusing on both discourse, norms, and power on the one hand, and bodies, emotions and lived experience on the other, is a more useful way to study men and masculinity. However, he further stresses that empirical analysis needs to be situated in relation to the intersection of inequalities such as race, class, sexuality, age, and ability (e.g., Hill Collins 1990; Yuval-Davis 2011).

Cornwall (2005) raises several questions about 'sex' and 'gender' which challenge taken-for-granted ideas about what it is to be a 'man' or a 'woman'. Her detailed and subtle ethnography locates processes of gendering in the interactions between actors in particular situations. These interactions establish the gender of the actors within different domains of discourse. Thus, she accentuates the importance of focusing beyond 'discursive formation' as such; actions and practices undertaken by the actors within the discursive hegemony that bear the potentials of subversion are important areas to investigate. It is in this spirit that we focus on *khota* and other expressional ways that could be termed as 'everyday forms' or 'minor genres' of resistance (Scott 1985; Pun 2005).

Brief note on methodology

This write-up is mainly concerned as to how the norms, values and behavior related to the ideology of 'man the provider' comes to be disputed, reshaped, or reinstated in diverse ways in the context of Dhaka city's working-class families and households, particularly as the neoliberal market order works as the dominant force to regulate both formal and informal domains. It draws on two studies carried out by the authors – one done in the mid-1990s and the other form in the late-2010s – with a view to unravel how the making and unmaking of norms and practices relating to masculinity continues, discontinues, or takes new forms in urban context of Bangladesh in recent decades.

To narrate how men and women interpret their behavior and action relating to ‘newer’ forms of compliance and contestation, we draw on our ethnographic studies and reflect in critical ways. The life histories and case studies that we present here are drawn from both the studies that were conducted in ethnographic ways.

Socialization and social construction of masculinity

The conventional social and cultural order in Bangladesh positions men as the ‘providers’ and ‘protectors’ who are socialized to take responsibility of women, children and aged members of the household. The fundamental notion underlying the social formation of masculinity is the view that a ‘responsible male’ would play role as the ‘provider’ for the household. Women, on the other hand, are conventionally viewed to be associated with homemaking and household works; from their childhood they are mostly taught to be dependent on men for their maintenance. However, a close look into the everyday life shows that there occurs moments and instances in which women – and in some case men too – question and ridicule many of the assumptions and norms that are stressed through socialization process.

Generally, the way a mother raises her son involves highlighting the point that he must grow up with some ‘masculine qualities’. Both men and women subscribe to these norms: men should be physically and emotionally strong; men should not engage in household work; they should work outside, that is, in public domain; they are not responsible for nursing children or the ill household member; kitchen is not the place that they should go into; cooking is not the chore that should be concerned about. These hegemonic norms, in turn, create expectation and pressure on men to establish themselves as the bread-earners and ‘guardian’ of the families.

Men are identified with the public sphere in the visible activities of neighborhood or national politics, commercially arranged sports and leisure outside home. Travelling around and making friendship with men other than kin are perceived to be part of men’s ‘normal’ development process. Thus, socialization itself reinforces significant asymmetrical norms as men are expected and trained to assume the role of ‘responsible man’ and to become providers of family, but they are not encouraged to develop much emotional attachment or feelings to their families. It is common that mothers discourage their sons to be involved in housework, especially if a daughter is around. Sons are encouraged to think about income earning as they reach the verge of adulthood; they are taught to think about earning wage through a work which is of public nature. However, in case of the study in Dhaka’s suburban areas among garment workers in late 2010s, it was observed that along with boys, girls also were expected to be ready to engage in factory job to give support to their parents and siblings. However, although the girls are taking up factory jobs and contributing increasingly to family’s income earning, they are not viewed as ‘dependable’ in case of old-age vulnerabilities of their parents. Parents still mostly hope to rely on their sons as the ‘provider’ of the future. As the mothers want the boys to grow with the ‘pride’ of being ‘provider’ and ‘protector’, they discourage them to be involved in cooking or food preparing tasks. Staying at home to do housekeeping chores is almost prohibited for sons once they reach adolescence. Sons reaching adulthood are expected and pressurized by their mothers to earn from wage work.

However, not all men and women appear to be too eager to go with the dominant narratives. Some tensions and unease in terms of going along the socialization 'playbook' was not difficult to discern for us as we conducted our research. On many instances we saw that young boys and girls were undertaking some housework, either because mother asked for it, or they did it willingly. Even though it may appear to be 'paradoxical' given the dominance of patriarchal norms, we saw that many of the mothers were proud of sons as they helped mothers and sisters on their own accord. In some cases, we saw sons and brothers to extend their hand to the female family members to carry out the everyday household chores – they did it as they felt that burden for their mothers or sisters were too much. It is important to recognize the empathy and feeling that are endangered in such ways and surpass the framework of dominant norms. We have also observed the behavior of many husbands who wash and clean the clothes of their wives; however, with the fear of 'stigma' they are unwilling to let it be known to the neighbors and other family members. In many cases, we have seen that mothers' give emphasis on moral education of their male children with a hope that they will not grow up as abusive, oppressive or irresponsible as their fathers.

Masculinity and crisis of positionality

Men's response to women's wage earning in the context of impoverished households is not fixed or unwavering. In the face of diverse insecurities and precarity, many men try to find a course of action and response that does not necessarily fit into 'patriarchal' frames. Because of extensive hardship, a man may fail to perform all the duties and expectations relating to a 'responsible' provider; this means that the image of 'man the provider' comes under threat. In such cases, men give way to this realization that carrying out all the expected duties in the family is not possible without taking help from other household members. It is in this context that allowing and encouraging female members of the household to engage in wage earning jobs in the factories has become rather common. In fact, the course of men's responses towards women's wage earning and employment is shaped depending not only on the views and expectations of the male members as such, the situation of the household's hardship as well as other external factors contribute significantly as to what decision is to be taken.

In many households in our both ethnographic sites we have observed that non-adult and unmarried sons sometimes share household responsibilities with their mothers even though such sharing at times causes tensions. Sons are seen to have sympathy as regards huge workload that their mothers have to carry on. This feeling of empathy is particularly evident in case of those mothers who are left behind by the irresponsible husband. Mothers are also sympathetic to their sons as they carry the workload which their fathers are supposed to shoulder.

However, in case of filial relationship, ownership and inheritance of property at times emerge to be most influential factor and it is where men's masculine crises come easily to the fore. In some cases, it was seen that brothers may even cut off all ties with their sisters because of tensions that arise as regards property ownership.

Dilu was working as an electrician until three years ago, but then he joined a group of men who do not believe in family ties, he left his wife, Arifa, and their five children behind to wander around in his own way. However, once in a month or two he would

come back to see his family. For Arifa it was quite agonizing; however, she still tried to convince him to resume his family responsibilities. Dilu agreed on the condition that Arifa should obtain her share from her brother as he was selling of their paternal residence. Although Arifa wanted to keep this as her last resort, she again wanted to give her husband a chance to restart a new business. She asked her brother for the share. Her brother was looking after their widowed mother, and he found his sister's behavior quite 'selfish'. On much insistence from Arifa's side, the brother gave her the 'share' of the property. However, as he was too shocked, he decided to cut off his relationship with Arifa.

On the other hand, as Arifa got the money from her brother, Dilu got hold of it and gradually squandered away on gambling. And it became clear that he was never going to be 'responsible' or 'provider' to his family as he was more into having fun with his peer group particularly through gambling. Now the situation for Arifa was that she lost on both the ends: not gaining in terms of capacitating her husband; and losing the last 'shelter' at her brother's place.

Arifa's sufferings took another twist as she became pregnant with the fifth child due to her husband's sudden visits. Her husband had never let her use any form of birth control, but subsequently she had to go for a 'ligation' (that is, permanent birth control) without asking his permission. When Dilu found this out, he became terribly angry, beat her with electric wire and threatened to divorce her. Arifa could not work for a week, and she was worried about the children and her future. She knew that if Dilu forced a divorce, she now had nowhere to go as her return to brother's place was out of question.

The ways 'masculine' features of Arifa's brother and husband came to be expressed was not similar – however, one could still find some uniformity as to how they tried to 'negotiate' the dominant ideology and had to 'give up'. Our discussions with Arifa's brother and husband bring forth how an interplay between subjective decision and systematic discourses takes place. Her husband highlighted that despite several efforts, he could not give away his fondness toward gambling whereas her brother explained how he felt 'betrayed' by Arifa's behavior even though he knew that she was legally entitled to have the share of the property. Two men's effort to do things in accordance with 'personal rationales' was overtaken by feelings and emotions which were more connected to the discursive aspects of hegemonic masculinity. The way they struggled to deal with the affects – even though unsuccessfully – needs to be recognized and considered.

Father's decision as to daughter's work, income earning, and marriage is another 'site' that shows confluence of patriarchal norms and situational negotiation. Mala was the only earning member in the family and her father was not willing to allow her to be married as he was afraid of losing her income. He even used physical power against Mala in a bid to stop her from getting married.

In the households where daughters work to contribute to the survival of their family, usually the total income of the daughters is handed over to the parents. In Mala's case her father would have control of all her earnings and then allocate a part of it to her. Therefore, letting Mala to get married would mean losing potential source of income forever.

The dominant ideology is that parents should not take financial support from their daughters after she was married off. However, the actual practice does not go along with this narrative. In many households we have found that married daughters continued to support their parents, while married sons withdrew such support using the excuse of poverty. In Mala's case the father presented himself as a well-wisher of his daughter who, in his opinion, could not see the weaknesses of choosing a marital relation. He tried to tell Mala that sooner or later her husband would be blaming her for her 'loose character' and will marry another woman. Through the whole process of Mala's decision to get married, her father never directly requested her to consider their household situation and to postpone the marriage until her younger brother could take over her financial responsibility. The fear of losing the prime income earner, the shame of spelling out the truth, and the fear of being taken as an irresponsible father made the reality unspeakable. By employing the tropes of 'pride' and 'well-wishing', Mala's father tried to inflict a sense of guilt into her. He continuously tried to say that what she was doing was irrational. Mala could understand why her father acted that way; however, she could not voice the truth as she had to be respectful to her father's 'self-esteem'.

On the one hand, this example of a father disguising his vulnerability and, as a result, showing anger regarding his daughter's 'choice' as a 'wrong decision' gave the daughter a remarkable shock. On the other hand, she had to accept her 'non-provider' status in her husband's house to prove that the challenge had been worth taking. A wife may lose the opportunity of being an economic contributor in a conjugal relation where the husband is establishing himself as the 'provider' for the family.

In Mala's case, the pride of her father helped to open the path for her husband to exercise his power over his wife through claiming his 'provider' status. Control of women's agency by the male 'guardians' of their family makes women stay away from exercising their agency.

Dilemmas relating to patriarchal 'expectations'

By the time, one of us (Islam) met Rabiul, he had been married to Jamila for 17 years; however, he never allowed Jamila to be employed outside house, although Jamila would go out every day to buy the groceries and other household essentials. She was also active in taking decisions about children's education and other important family matters. Rabiul was into plant selling business and could not earn enough to maintain the household. He acknowledges that his wife's income could be crucial for the wellbeing of their children, however, he was not ready to concede to the idea that she should go outside home to engage in wage earning activities. This attitude of Rabiul was due to a particular incident that happened in his family. His conviction was that a job outside home would make Jamila 'uncontrollable' – and she could get spoiled. Rabiul's thoughts and actions were mostly informed by what had happened in case of his two sisters. Had the incident not took place in the family, he claimed that he would not be so stubbornly negative as regards his wife's work or income earning.

By the time Rabiul married Jamila, his sisters were working as a 'cook' in a mess. He had good understanding with his sisters, and they shared the same house. Ten years ago, his elder sister married an Urdu speaking man and migrated to Pakistan. Later, the younger sister followed the same course and migrated to Pakistan. Rabiul came lately to be

informed that his sisters were engaged in sex-work in the foreign country. He decided to keep no contact with them, and he never says a word about the sisters to his fourteen-years-old daughter.

Rabiul rejected all the possibilities of his wife entering in a job outside home, even if it was better paid. To keep his wife 'in line', he even controlled Jamila's yearly visit to her parents' place and demanded that she always completed housework according to his preferred timetable. Above all, he made it clear that what mattered the most to him was a 'peaceful' atmosphere at home. He also would complain that his wife had crossed the line by adopting birth control measures after the birth of two children.

Men like Rabiul, who perform their responsibilities as father and husband, do achieve the respect and power to control their daughters and wife. The respect is paid not only by the society in general but also by wife and daughter. Thus, when women become involved in paid work, such men suffer from a sense of defeat. It may become a continuous source of anxiety and frustration, or a challenge and a threat when these men face the employment of daughters, mothers and particularly wife within the household in their everyday life.

The complicated emotional state of mind of these men usually shows themselves in diverse ways: most commonly, they resist their wife and daughter from taking up work outside home; they challenge them verbally or physically; distance socially and psychologically from women by ignoring them totally; and withdraw themselves from their responsibilities (Abu-Lughod, 1986).

A 'peaceful home' is one of the common demands of responsible husbands. This not only emphasizes competent and prompt completion of household tasks, but also puts stress on a women's skill at keeping children in order; most of all it requires that the woman do not go for making many claims or demands. They also want the women not to quarrel over household tasks. Such pressure is used by husbands to keep women under constant 'fear' and establishes husbands as empowered. Out of fear of losing their 'secured life', wives like Jamila try their best to maintain peace at home.

Beyond hegemonic masculinity: Contestation and resistance

Although the dominant social construction equates 'male' with 'provider', there are always exceptions to the perceived norm; for example, dislocated males who do not act as responsible men. Such men are looked down upon by the entire community, especially by their wife and unmarried daughters, and are referred to as *jinda-lash* (living cadaver), *Mofij* or *badaimma*. Due to their apathetic attitudes towards their families, or their physical absence from a family, they are depicted as synonymous to a dead person or useless one. They do not correspond to the dominant notion of 'hegemonic masculinity' and have proved that they fail to fulfil their responsibilities because of their unemployment, idleness, or unwillingness to work. The expression *jinda lash* is used about men who are *heronchis* (drug addicts), *neshakhor* (alcoholics), *juaree* (gamblers), *ailsha/kamchor* (lazy and unwilling to do any work), *dayiottyayheen* (irresponsible), *appadartho* (unworthy), *charitroheen* (involved in extra-marital affairs, the literal meaning is one without a character).

The term *Jinda lash* is never used in relation to old and ill male members of the household. Here it must be pointed out that men do not always enjoy being unable to

take responsibility for their family. Men who used to be very responsible about the economic wellbeing of their family become emotionally tormented when they have to give up playing the role due to forced unemployment. The case of Sohrab Ali narrated in the beginning of this write-up could be viewed to have correspondence to such making of *jinda-lash* in a precarious context.

The expression *jinda-lash* is a class and sub-culture-based term, which stresses the implication that it is not acceptable for any able-bodied man not to work and not to earn for his family. It is a derogatory term, emphasizing that non-earning, irresponsible men are considered to be dead for the women immediately related to them and for the household. An important point is that a man with a good income can be *jinda-lash* for his family if he spends his income on another woman (i.e., in an extra-marital relation). Whatever may be the reason behind men falling into the category of dislocated male, the concept of *jinda-lash* itself puts these men in a degraded position, and in doing so it reaffirms the dominant social ideology of male provider. In all households with an irresponsible or dislocated male, the burden of earning a livelihood falls on the shoulders of the wife, unmarried daughters, and other minor members of the household. The responsibility of looking after the welfare of the family is entirely borne by women.

It might be expected that a man in the state of *jinda-lash* would accommodate social transformation more easily. However, what we have found is that they were particularly resentful or challenging their wife at different points in their working lives, demanding when it suited them that the wife either take or leave their employment, or behave like a full-time housewife even they are employed full time. They blame their wives over trivial issues and abuse them both verbally and physically to demonstrate/reinforce their authority over the women. They also create distance from their responsibilities by ignoring or avoiding the women. Ways to do this may range from not listening to their women, to rejecting the relationship by staying away from home, for either a short or a long period of time.

We have observed that men in such precarious condition generally goes into a state of denial. As they become conscious of the fact that they are not carrying out their responsibilities and losing their authority over the female members, they start to feel insecure. This feeling then causes diverse crises as it happened in case of Sohrab Ali.

Khota: Minor genres of resistance?

As mentioned earlier, *khota* (teasing or ridiculing) is a strong ‘verbal tool’ used primarily by women against their husbands when they fail to get their entitlement from their husbands. Commonly, women in Bangladeshi culture do not challenge their men directly but express their wishes through *khota*. Generally, *khota* means ridicule of an unbearable or undesirable situation, or, teasing a person about his/her power, which may or may not be based on legitimate grounds. *Khota* is used to provoke a person to change his ways of behavior and conduct. For women, it is an expression of ‘veiled sentiment’ where the unreliability, inability or irresponsibility of men can be managed, and their resentment can be brought out into the open. Usually, women and powerless people use *khota* to deal with their seniors or superiors. Therefore, within male-female relationships it carries a contradictory message. *Khota* gives a chance for women to speak about an unspeakable situation or relation; however, it is women who use it.

Men also give *khota* to other men and to women, and women use *khota* against each other. Although this section has touched on *khota* used by all parties, its primary concern is to analyze the concept of *khota* as a 'weapon of the weak', i.e., when poor women use *khota* to express their disappointments and frustration. In Bangladesh, women initiating physical abuse of their husbands are almost unheard of, but women do resort to *khota* as they have no other way of getting back at their husbands. Use of a similar verbal tool as *khota* in the form of poetry has been reported in another study (Abu-Lughod, 1986).

Our main argument is that women are not passive. They do at times challenge the dominant forms of masculinity, while at other times they comply with its hegemonic presence. This reveals two important aspects of women's lives: (a) acceptance or reaffirmation of their weak position in conjugal relations; (b) their frustration about constantly compromising with their situation. This is apparent from the fact that although women are verbally abusive towards their husbands, they do not necessarily conform to their abusive attitude and behavior; furthermore, the language of resistance or *khota* is developed around the concept of female dependency on men for maintenance and protection (Mukhopadhyay, 1994).

In the impoverished households both men and women share a common vulnerability to some extent. However, as women critically rely on their family, intra-household politics puts them in a more vulnerable position than men. The points where women challenge men usually occur in response to men's unwillingness to earn for the family. While violent action by men against women is a common in poor households, women mainly resort to verbal abuse towards their men. I neither observed it, nor was it reported to me that women ever had initiated a physical attack on their husbands even if they have committed a significant offence inside or outside the household. On the other hand, the husband can take a women's late return from work as a serious offence.

As men and women's relationship is unequal, they use different strategies to deal with each other. For instance, Rabiul instructed his wife and daughter not to keep any contact or relationship with his sisters and stopped Jamila from doing work outside the house. Arifa's husband, Dilu, ordered her to demand the share of her parental house from her brother, and punished her for taking an independent decision about her sterilization. Mala was given a straight denial of her own decision to marry. *Khota* can however be a direct challenge to the roles of husband and wife. There is a possibility that the husband will become violent or leave the house or withdraw from the relationship because of the wife's uses of *khota*. The wife risks of losing the bargain as she loses the husband, she gets more physical or verbal abuse from him.

Taking all the risks into account, it appears that *khota* does not appear to give advantage to the women at all in a husband-wife relationship. However, the use of *khota* by nature is a spontaneous reaction to the tensions that mount up over a long period of time. The risk that such banter might involve is not likely to be calculated by the user in advance.

Conclusion

We have highlighted how the widespread precarity creates the ground for men and women to act and react in diverse ways, and how their actions unravel diversity of the ways that might not be congruent to the expectations of a development practitioner or

social observer who views the things from 'outside'. We draw attention to the point that the socially and culturally informed forms of happiness and wellbeing – and the search for peace and stability in home and marriage – are far more complicated, contextually-informed, and vibrant than the enforcement of patriarchal ideology as such. There are no straightforward trade-offs between women gaining more economic capacity and men losing their control over things in the household and beyond, even though contestation, negotiation and making-unmaking process is always in flux.

Direct and indirect usage of language may in some contexts prove to be the evidence of social power of the speaker. Constant manipulation and negotiation by the women show how they deal with male power in a situation of confrontation or conflict. Aggressiveness or assertiveness of women might cost a total relationship; therefore, women strategically take indirect path of manipulation. Agency and resistance do not come to be expressed in straightforward way; however, it is important to recognize the minor or everyday ways in which power and hegemony is contested. It is a call for going beyond neoliberal development to make way for gender justice. Everyday life realities accentuate the point that mere market-incorporation or wage earning activities by women fails to create substantial ground for revising the gender practices even though there occurs instances and moments that question the coercive power of the hegemonic ideologies.

References

- Abu-Lughod, L., 1986, *Veiled Sentiment*, University of California Press, London.
- Agarwal, B., (ed.), 1988, *Structures of Patriarchy, Kali for Women*, New Delhi.
- Alavi, H., 1989, *Formation of the Social Structure of South Asia Under the Impact of Colonialism*, in Alavi, H. and Harris, J., (eds.) *Sociology of Developing Societies: South Asia*. Macmillan Press, London.
- Begum, S. and Greely, M., 1979, *Rural Women and the Rural Labour Market in Bangladesh: An Empirical Analysis*, *Bangladesh Journal of Agricultural Economics*, Vol.2, No.2.
- Beneria, L., 1981, *Conceptualizing the Labour Force: The Underestimation of Women's Economic Activities*, pp10-28 in Nelson, N. (ed.), *African Women in the Development Process*, Cass, London.
- Boserup, E., 1970, *Women's Role in Economic Development*, Allen and Unwin, London.
- Bourdieu, P., 1977, *Outline of A Theory of Practice*, Cambridge University Press, Cambridge.
- Butler, J., 1977, *From Gender Trouble*, in Gould, C. C., (ed.), *Gender: Key Concepts in Critical Theory*, Humanities Press, New Jersey.
- Cain, M.T., 1978, *The Household Life Cycle and Economic Mobility in Rural Bangladesh*, *Population and Development Review*, Vol-4, part 3, 421-22.
- Cornwall, A. and Lindisfarne, N. (ed), 1994, *Dislocating Masculinity: Comparative Ethnographies*, Routledge, London.
- Das, V., 1976, *Indian Women: Work, Power and Status*, in Nanda, B.R. (ed.), *Indian Women from Purdah to Modernity*, Vikas, New Delhi.
- Dasgupta, B., 1973, *The Informal Sector and Marginal Groups*, *IDS Bulletin*, Vol.5, no.3.
- Dasgupta, P., 1996, *An Enquiry into Wellbeing and Destitution*, Oxford University Press, Oxford.
- Davidoff, L. and Chathrine, H., 1987, *Family Fortunes*. Hutchinson, London.

- Delphy, C, 1979, Sharing the Same Table Consumption and the Family, Sociological Review Monograph, University of Keele, Vol. 28.
- Delphy, C. and Leonard, D., 1992, Familiar Exploitation. Polity Press, Cambridge.
- Feldman, S., 1992, 'Crisis, Islam and Gender in Bangladesh: The Social Construction of a Female Labour Force, in Beneria, L. and Feldman, S (eds.), Unequal Burden: Economic Crises, Persistent Poverty and Women's Work, pp 105-30, Westview, Boulder, Colo.
- Feldman, S. and McCarthy, F., 1983, Purdah and Changing Patterns of Social Control Among Rural Women in Bangladesh, Journal of Marriage and the Family, November, pp949-59.
- Harris, O., 1981, Households as Natural Units, in Young, K. et al., Of Marriage and the Market: Women's Subordination Internationally and its Lessons, pp93-116, Routledge, London.
- Hart, K., 1973, Informal Income Opportunities and Urban Employment in Ghana, in Jolly, Third World Employment Patterns and Strategies, Penguin, Harmondsworth.
- Hartmann, B., and Boyce, J. K., 1983, A Quiet Violence: View from a Bangladeshi Village, University of Dhaka Press, Dhaka.
- Hartmann, H., 1987, The Family as the Locus of Gender, Class and the Political Struggle: The Example of Housework, in Harding, S. (ed.), Feminism and Methodology, pp109-34. Indiana University Press, Indianapolis.
- Hashemi, S. and Schuler, S., 1996, Rural Credit Programs and Women's Empowerment in Bangladesh, World Development, 24(4) pp635-653.
- Hossain, H. et al., 1990, No Better Option: Industrial Women Workers in Bangladesh, Dhaka University Press, Dhaka.
- Huq-Hussain, Shanaz, 1996, Female Migrants' Adaptation in Dhaka: A Case of the Processes of Urban Socio-economic Change, University of Dhaka, Department of Geography, Urban Studies Programme, Dhaka.
- Islam, F. and Zeitlyn, S., 1989, Ethnographic Profile of Dhaka Bastis, Oriental Geographer, Dhaka, Vol.31, No.1-2.
- Jahan, R., 1989, Women and Development in Bangladesh: Challenges and Opportunities, Ford Foundation, Dhaka.
- Jenkins, E., 1997, Housing, Gender and Work in Dhaka, in Beal, Jo (ed.), A City for All, Difference and Working with Diversity, Zed Books, London.
- Joekes, S., 1985, Working for Lipstick? Male and Female Labour in the Clothing Industry in Morocco, in Afshar, H. (ed.), Women, Work and Ideology in the Third World, pp183-213. Tavistock, London.
- Kabeer, N., 1991, Cultural Dopes or Rational Fools? Women and Labour Supply in the Bangladesh Garment Industry, European Journal of Development Research, 3(1) pp133-160.
- Kandyotti, D., 1988, Bargaining with Patriarchy, Gender and Society, 2 (3), 274-290.
- Kemp, S., 1987, How Women's Work is Perceived: Hunger or Humiliation, in Bjorkmann, J. (ed.), The Changing Division of Labour in South Asia, pp84-100, Manohan, New Delhi.
- Khan, R.Z., 1992, Women Work and Values, Centre for Social Studies, University of Dhaka, Dhaka.
- Khan, S., 1988, The Fifty Percent: Women in Development and Policy Bangladesh, University Press Limited, Dhaka.

- Khundker, N., al., 1994, Urban Poverty in Bangladesh: Trends, Determinants and Policy Issues, *Asian Development Review*, Vol.12, No.1,
- Kibria, N., 1995, Culture, Social class and income control in the Lives of Women Garment Workers in Bangladesh, *Gender and Society*, 9(3), 289-309.
- Lewis, J., D., 1993, Going It Alone: Female-Headed Households, Right and Resources in Rural Bangladesh, *European Journal of Development Research*, 5(2) pp 23-42.
- Majumder, P.P. et al.,1996, *The Squatters of Dhaka City: Dynamism in the Life of Agargaon Squatters*, University Press Limited, Dhaka.
- Molyneux, M., 1979, Beyond the Domestic Labour Debate, in *New Left Review*, No.8, pp3-27.
- Moore, H, 1988, *Feminism and Anthropology*, Polity, Cambridge.
- Moser, C., 1975, Informal Sector or Petty Commodity Production: Dualism or Dependence in Urban Development? *World Development*, 6:9/10 pp1041-64.
- Moser, C., and Young, K., 1981, Women and the Informal Sector, *IDS Bulletin*, Vol.12, No3, University of Sussex.
- Mukhopadhyay, M., 1995, Gender Relations, Development, and Culture, *Gender and Development*, Vol. 3, No. 1, Oxfam.
- Ong, A., 1987, *Spirits of Resistance and Capitalist Discipline: Factory Women in Malaysia*, SUNY Press, Albany.
- Ong, A., 1988, Colonialism and Modernity: Feminist Re-presentations of Women in Non-Western Societies, *Inscriptions: Feminist and the Critique of Colonial Discourse*, 3/4 pp79-93.
- _____, 1991, The Gender and Labor Politics of Postmodernity, *Annual Review of Anthropology*, Vol.20, pp279-309.
- Ortner, S., 1995, Resistance and The Problem of Ethnographic refusal in Comparative Study of Society and History, 37, (1).
- Pearson, R., Whitehead, A. and Young, K., 1981, Introduction', in Young, K., Wolkowitz, C., and McCullagh, R. (eds.) *Of Marriage and the Market: Women's Subordination Internationally and its Lessons*, Routledge, London.
- Putnam, R. D., 1995, Bowling Alone: America's Declining Social Capital, *Journal of Democracy*, 6 (1).
- Rahman, H.Z.,1995 Crisis and Insecurity: The other 'face' of Poverty, in Rahman, H.Z. and Hossain, M.(eds.), *Rethinking Rural Poverty in Bangladesh*, University Press Limited, Dhaka.
- Ram, K., 1989, The Ideology of Femininity and Women's Work in a Fishing Community of South India, in Afshar, H. and Agarwal, B.(eds.), *Women, Poverty and Ideology in Asia*. pp128-47. Macmillan, Basingstoke.
- Rosaldo, M.Z. and Lamphere, L. (eds.), 1974, *A Theoretical overview: Women, Culture, Society*, Stanford University Press, Stanford, Calif.
- Safa, H., 1990, Women and Industrialization in the Caribbean, in Stichter, S. and Parpart, J. (eds.), *Women, Employment and the Family in the International Division of Labour*, pp72-97. Macmillan, London.
- Salaff, J., W., 1981, *Working Daughters of Hong Kong*. Cambridge University Press, Cambridge.
- Scott, J. C., 1985, *Weapons of the Weak: Everyday Forms of Peasant Resistance*, Yale University Press, New Haven.

- Sen, A.K., 1990, Gender and Co-operative conflicts, in Tinker, I. (ed.), *Persistent Inequalities: Women and World Development*, pp123-49, Oxford University Press, Oxford.
- Sharma, U., 1980, *Women, Work and Poverty in North West India*, Tavistock, London.
- Siddiqi, D., 1991, Discipline and protect. *Grassroots*, 1(2), ADAB, Dhaka.
- Standing, G., 1985, Circulation and the Labour Process, in Standing, Guy (ed.), *Labour Circulation and the Labour Process*, pp 1-45, Croom Helm, London.
- Standing, H., 1991, *Dependence and Autonomy: Women's Employment and the Family in Calcutta*, Routledge, London.
- White, S., C., 1992, *Arguing with the Crocodile: Gender and Class in Bangladesh*, University of Dhaka Press, Dhaka.
- Zeitlyn, S. and Islam, F., 1997, Mothers' Education and Autonomy, in Visaria, Leela, Simons, John and Berman, Peter (eds.), *Maternal Education and Child Survival*, Vikas, New Delhi.

The Long-Run Perspective of Life Expectancy and Economic Growth in the South Asian Countries

Mala Rani Das^{*}
Laila Haseen^{**}
Tareq Imam Zahid^{***}

Abstract: Economic growth is one of the prime priority of macroeconomic aspirations of any country. The major focus of this study is to examine the long-run dependency between life expectancy and economic growth in six south Asian countries. The study has used secondary data to find the relationship over the time 1984 to 2017. Non-stationary panel techniques have been employed for empirical works. Results of Levin, Lin and Chu t* test; Breitung t-stat; Im, Pesaran and Shin W-stat; Augmented Dickey Fuller(ADF) Fisher Chi-square and PP Fisher Chi-square test reveals that data set is stationary. Using Pedroni residual cointegration and Kao residual cointegration test the study has confirmed that there is long-run relationship between the life expectancy at birth and economic growth. Then employing panel dynamic ordinary least square (DOLS) the study has indicated significant positive relation between life expectancy and economic growth.

Keywords: economic growth, life expectancy, panel cointegration, panel DOLS.

Introduction

The human capital accelerates the economic growth of a country according to the neo growth theory (Ngangue & Manfred, 2015). Healthy population and economic prosperity both are positively interlinked (Piabuo & Tieguhong, 2017). Healthy population performs better in creativity, education, skills, and life expectancy and as a consequence the tendency of social savings increases which in turns eventually affects the economic growth by enhancing the physical capital stock (Somayeh et al., 2014). On the other hand, improvement in longevity may lead to lower per capita income because of the increased population and having narrow scope to get expansion of existing resources among the huge population (Sharma 2018). The importance of health can be justified by the popularity of Human Development Index (HDI) in different countries (Djafar & Husaini, 2011). High-income countries generally have low mortality rate than low-income countries, which means that the mortality is associated with the income across the countries (Shkolnikov et al., 2019). The life expectancy plays an important role to improve the per capita income (Boucekkine & Azomahou, 2007).

The change in life expectancy changes the stock of human capital and the change in human capital influences the economic growth of a country. Moreover, there exists a research gap in the literature which investigates the long-run dependency between life expectancy and economic growth in South Asian countries as a whole. Thus the study has

* Lecturer, Department of Economics, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh. E-mail: mrdas@juniv.edu

** Associate Professor, Department of Economics, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh. E-mail: lailahaseen@yahoo.com

*** Assistant Professor, Department of Economics, Bangladesh University of Business and Technology (BUBT), Rupnagar R/A, Mirpur-2, Dhaka-1216, Bangladesh. E-mail: tareqimamzahid@yahoo.com

been conducted with an objective of addressing whether there exists or not any long-run dependency between life expectancy and economic growth in South Asia.

Health is a part of human capital and health is represented by life expectancy at birth. On the other hand human capital significantly affects economic growth. That's why we are willing to observe the impact of life expectancy at birth on the economic growth of six South Asian countries at big scale as health sector is less perfect in these south Asian countries than that of developed countries.

Literature Review

Currais (2000) and Zaman et al. (2017) found that per capita income and health expenditures are positively related whereas Babatunde (2012) showed that the health to government expenditures ratio negatively affects the economic growth in Nigeria. Rengin (2012) and Piabuo & Tieguhong (2017) revealed the presence of the long-run dependency between economic growth and health expenditures. Rengin (2012) also confirmed that this sort of relationship does not exist in the short-run. Bloom et al. (2004), Aghion et al. (2011), Babatunde (2012), Mahumud et al. (2013), Somayeh et al. (2014), Ngangue & Manfred (2015), Mahyar (2016), Kouton et al. (2018), and Sharma (2018) found that life expectancy and economic growth are positively related. This kind of relationship has the high probability to happen in Asian countries in the long-run rather than in the short-run according to Djafar & Husaini (2011). On the other hand, Ismail et al. (2015) did not find any long-run relationship between economic growth and life expectancy in Malaysia. Boachie (2015) found both the short-run and long-run relationships in the context of Ghana. GDP and life expectancy are positively related according to Ebenstein et al. (2015), Bai et al. (2018), and Shafi & Fatima (2019). Hansen & Lønstrup (2015) represented the negative relationship between life expectancy and economic growth by analyzing 141 developing countries. Brendan & Sek (2017) expressed that in the long-run the population with a high number of old aged people negatively affects the economic growth whereas the population with a high number of young aged people positively affects the economic growth.

Although many researchers analyze the dependency between life expectancy and economic growth in the context of both developed and developing countries including the Asian countries, but there are no rigorous studies found that explain the same topic dedicatedly in the context of South Asian countries as a whole in the long-run time frame. This is why the present study has been initiated.

Data and Method

To investigate the effect of life expectancy on economic growth in six South Asian countries the study used secondary data. The data of those six countries namely Bangladesh, India, Pakistan, Sri-Lanka, Nepal and Bhutan over the time 1984 to 2017 collected from world development indicators. In this study the data of cross section and time series have been pooled together to realize the relationship between life expectancy and economic growth.

The study has the following model:

$$EG = \beta_0 + \beta_{1i}LEB_{it} + \varepsilon_{it}$$

Where EG represents economic growth taken as percentage form of annual GDP growth and LEB represents life expectancy at birth (converted as annual percentage form). Where the subscript $i = 1, \dots, N$ that denotes individual countries and $t = 1, \dots, T$ represents time period, β_0 is the constant term, β_{1i} represents the change in EG as a result of one extra unit change in LEB, and ε_{it} represents idiosyncratic error term which captures the effects of the factors on the dependent variable that vary both across entity and over time and hence purely random.

Non-stationary panel techniques have been employed here for empirical works of this study. So it is essential to check first whether there is unit root problem or not. To check the stationarity of data the study has chosen the Levin, Lin and Chu t , the Breitung t -stat, the Im, Pesaran and Shin W -stat, the ADF Fisher Chi-square, and the PP Fisher Chi-square tests based on augmented Dickey Fuller test (Maddala and Wu 1999) :

$$\Delta V_{it} = \mu_i + \rho_i V_{i,t-1} + \sum \beta_{ij} \Delta V_{i,t,j} + \varepsilon_{it}$$

where $i = 1, \dots, N$ and $t = 1, \dots, T$

If $\rho_i = \rho$ for the i^{th} cross section unit then the null and alternative hypothesis of Levin-Lin test can be expressed as:

$$H_0: \rho_1 = \rho_2 \dots = \rho_N = \rho = 0$$

$$H_1: \rho_1 = \rho_2 \dots = \rho_N = \rho < 0$$

the Levin, Lin and Chu t , the Breitung t -stat, the Im, Pesaran and Shin W -stat, the ADF Fisher Chi-square, and the PP Fisher Chi-square tests

The Pedroni and Kao tests have been employed to check the cointegration between the observed variables. The Pedroni and Kao tests are based on Engle-Granger (1987) two step residual based on cointegration test. Pedroni (1999, 2004) and Kao (1999) extend the Engle-Granger framework to test involving panel data. If variables are cointegrated then we can apply DOLS for determining the nature of long run relationship.

Result Discussion

Results of Panel Unit Root Test:

Results of Levin, Lin and Chu t^* test; Breitung t -stat; Im, Pesaran and Shin W -stat; ADF Fisher Chi-square and PP Fisher Chi-square test has been presented (table 1 to 4) to check the unit root problem when there is an assumption of individual effects as well as when there is an assumption of individual effects and individual linear trends of variables in both case of level forms and first difference forms of the variables. If the probability value is greater than 5% then we cannot reject the null hypothesis of unit root meaning that there exists unit root problem in data. All test results show that (from table 1 to table 4) the variables are non-stationary at levels but stationary at first difference in case of both assumptions that is individual effect as well as individual effect and individual linear trends.

Table 1: Panel unit root test, variables in level form (Individual effects)

| Variables in level form | Levin, Lin & Chu t-stat (Prob) | Im, Pesaran & Shin W-stat (Prob) | ADF-Fisher Chi-square (prob) | PP-Fisher Chi-square (prob) |
|-------------------------|--------------------------------|----------------------------------|------------------------------|-----------------------------|
| EG | -7.52136 (0.0000) | -8.29103 (0.0000) | 84.9460 (0.0000) | 85.1510 (0.0000) |
| LIFEEXP | 1.54734 (0.9391) | 1.53512 (0.9376) | 12.2880 (0.4228) | 2.77525 (0.9969) |

Table 2: Panel unit root test, variables in level form (Individual effect and individual linear trends)

| Variables in level form | Levin, Lin & Chu t-stat (Prob) | Breitung t-stat (prob) | Im, Pesaran & Shin W-stat (Prob) | ADF-Fisher Chi-square (prob) | PP-Fisher Chi-square (prob) |
|-------------------------|--------------------------------|------------------------|----------------------------------|------------------------------|-----------------------------|
| EG | -5.15561 (0.0000) | -3.92921 (0.0000) | -8.20297 (0.0000) | 77.2429 (0.0000) | 211.847 (0.0000) |
| LIFEEXP | -2.18696 (0.0144) | -1.57369 (0.0578) | -3.46239 (0.0003) | 41.1040 (0.0000) | 9.49012 (0.6606) |

Table 3: Panel unit root test, variables in 1st difference form (Individual effects)

| Variables in level form | Levin, Lin & Chu t-stat (Prob) | Im, Pesaran & Shin W-stat (Prob) | ADF-Fisher Chi-square (prob) | PP-Fisher Chi-square (prob) |
|-------------------------|--------------------------------|----------------------------------|------------------------------|-----------------------------|
| EG | -9.80014 (0.0000) | -14.3539 (0.0000) | 152.984 (0.0000) | 160.715 (0.0000) |
| LIFEEXP | -4.80529 (0.0000) | -6.41144 (0.0000) | 68.2084 (0.0000) | 15.8783 (0.1969) |

Table 4: Panel unit root test, variables in 1st difference form (Individual effect and individual linear trends)

| Variables in level form | Levin, Lin & Chu t-stat (Prob) | Breitung t-stat (prob) | Im, Pesaran & Shin W-stat (Prob) | ADF-Fisher Chi-square (prob) | PP-Fisher Chi-square (prob) |
|-------------------------|--------------------------------|------------------------|----------------------------------|------------------------------|-----------------------------|
| EG | -7.52774 (0.0000) | -4.83063 (0.0000) | -13.1426 (0.0000) | 135.200 (0.0000) | 1396.26 (0.0000) |
| LIFEEXP | -1.03203 (0.1510) | -2.19873 (0.0139) | -4.66757 (0.0000) | 47.0171 (0.0000) | 7.53264 (0.8205) |

Results of Panel Cointegration Tests:

Once the variables are stationary at first difference then the next step is to find the existence of long run relationship between the examined variables. For this the study proceeds with Pedroni test and Kao cointegration test to determine the long-run equilibrium relationship between the chosen variables under the null hypothesis. The null hypothesis is that there is no Cointegration. Automatic lag length selection is based on SIC with a max lag of 7 in case of no deterministic trend as well as deterministic intercept and trend. There are eleven statistics in Pedroni residual cointegration test (table 5). Among eleven statistics ten of them (table 5) are statistically significant as indicated by the corresponding probability value. As majority are statistically significant we can reject the null hypothesis of no cointegration that is we can accept the alternative hypothesis meaning that variables are cointegrated in the long-run as indicated by the Pedroni cointegration test. Moreover from the result of Kao residual cointegration test, we observe that probability value is statistically significant (table 6) at one percent level, hence we can reject the null hypothesis of no cointegration rather we can accept the alternative hypothesis, that is , variables are cointegrated meaning that there is long-run associated between the examined variables. Automatic lag length selection is based on SIC with a max lag of 8.

Table 5: Results of Pedroni residual cointegration test
Null hypothesis: No Cointegration

Automatic lag length selection based on SIC with a max lag of 7(no deterministic trend + deterministic intercept and trend)

| | No deterministic trend | | Deterministic intercept and trend | |
|--|------------------------|--------|-----------------------------------|--------|
| | Statistic | Prob. | Statistic | Prob. |
| Panel v-Statistic | 6.025471 | 0.0000 | 2.775144 | 0.0028 |
| Panel rho-Statistic | -9.906447 | 0.0000 | -7.360427 | 0.0000 |
| Panel PP-Statistic | -9.140837 | 0.0000 | -9.655702 | 0.0000 |
| Panel ADF-Statistic | -8.868651 | 0.0000 | -9.654393 | 0.0000 |
| Panel v-Statistic (Weighted Statistic) | -0.226444 | 0.5896 | -2.140600 | 0.9838 |
| Panel rho-Statistic (Weighted Statistic) | -7.941933 | 0.0000 | -5.764551 | 0.0000 |
| Panel PP-Statistic (Weighted Statistic) | -8.002951 | 0.0000 | -9.286006 | 0.0000 |
| Panel ADF – Statistic (Weighted Statistic) | -7.892113 | 0.0000 | -9.162218 | 0.0000 |
| Group rho-Statistic | -6.785818 | 0.0000 | -4.865393 | 0.0000 |
| Group PP-Statistic | -10.56511 | 0.0000 | -12.86703 | 0.0000 |
| Group ADF-Statistic | -8.892367 | 0.0000 | -9.501751 | 0.0000 |

Table 6: Result of Kao residual cointegration test

Null hypothesis: No Cointegration

Series: EG LIFEEXP

Automatic lag length selection based on SIC with a max lag of 8

| ADF | t-Statistic | Prob. |
|-----|-------------|--------|
| | -8.237934 | 0.0000 |

Results of Dynamic Ordinary Least Square: (DOLS)

As there is a long-run relationship between the variables we can apply DOLS to check to identify the nature of relationship. The result of DOLS exhibits that (table 7) life expectancy has positive impact on economic growth of selected six south Asian countries and the result is statistically significant as indicated by the probability value. We see that if life expectancy increases by 1% then economic growth increases by 7.38%.

Table 7: Panel dynamic least squares when there is cointegration (DOLS)

| variable | coefficient | t-statistic | Prob. |
|----------|-------------|-------------|--------|
| LIFEEXP | 7.380319 | 11.71577 | 0.0000 |

Conclusion and Recommendation

The objective of this study is to find out whether there exists any long-run dependency between life expectancy and economic growth in six South Asian countries. For this the study has used panel data of those selected countries of South Asia over the time 1984 to 2017. Results of Levin, Lin and Chu t* test; Breitung t-stat; Im, Pesaran and Shin W-stat; ADF Fisher Chi-square and PP Fisher Chi-square test showed that there is no unit root problem in the data set i.e. data set is stationary. Then applying Pedroni residual cointegration and Kao residual cointegration test the study has confirmed that there is long-run association between life expectancy and economic growth of selected six south Asian countries. After then applying dynamic ordinary least square (DOLS) the study has confirmed there is positive relationship between life expectancy and economic growth and the finding is statistically significant. This findings support almost all literature that the study has reviewed such as Bloom et al.,2004, Babatunde 2012, Boachie 2015, Ngangue & Manfred 2015, Ebenstein et al.,2015, Mahyar 2016, Piabuo & Tieguhong 2017, Kouton et al.,2018, Sharma 2018 etc whereas the findings of the study contrast with the findings of Ismail et al.,2015, Hansen & Lønstrup 2015 etc. The main limitation of this study is that the study used only life expectancy at birth to represent human capital as independent variables but there are also other variables in HDI index that the study has overlooked due to unavailability of data. As health is wealth and healthy people live longer than others, good health allows poor people to escape from poverty and contributes much in economic growth therefore government of respective countries should adopt more welfare activities to increase human capital. Government of developing countries should adopt more welfare activities to increase human capital which ultimately enhance economic growth.

References

- Aghion, P., Howitt, P. and Murtin, F., 2011. The relationship between health and growth: When Lucas meets Nelson-Phelps. *Review of Economics and Institutions*, 2, Article 1. doi: 10.5202/rei.v2i1.1.
- Bai, R., Wei, J., An, R., Li, Y., Collett, L., Dang, S., Dong, W., Wang, D., Fang, Z., Zhao, Y. and Wang, Y., 2018. Trends in Life Expectancy and Its Association with Economic Factors in the Belt and Road Countries—Evidence from 2000–2014. *International journal of environmental research and public health*, 15(12), p.2890.
- Boucekkine, R., Diene, B. and Azomahou, T., 2007. *A closer look at the relationship between life expectancy and economic growth* (No. 2007_24).
- Bloom, D.E., Canning, D. and Sevilla, J., 2004. The effect of health on economic growth: a production function approach. *World development*, 32(1), pp.1-13.
- Babatunde, M.A., 2012. The Relationship between Health and Economic Growth in Nigeria.
- Boachie, M.K., 2015. Effect of health on economic growth in Ghana: An application of ARDL bounds test to cointegration.
- Brendan, L.R. and Sek, S.K., 2017, August. The relationship between population ageing and the economic growth in Asia. In *AIP conference proceedings* (Vol. 1870, No. 1, p. 060005). AIP Publishing.
- Currais, L., 2000. Population, Growth and Health Expenditure
- Djafar, F. and Husaini, D.H., 2011. THE NEXUS BETWEEN HEALTH AND ECONOMIC GROWTH IN SELECTED ASIAN COUNTRIES. *International Journal of Business & Society*, 12(2).
- Ebenstein, A., Fan, M., Greenstone, M., He, G., Yin, P. and Zhou, M., 2015. Growth, pollution, and life expectancy: China from 1991-2012. *American Economic Review*, 105(5), pp.226-31.
- Engle, R.F. and Granger, C.W., 1987. Co-integration and error correction: representation, estimation, and testing. *Econometrica: journal of the Econometric Society*, pp.251-276.
- Hansen, C.W. and Lønstrup, L., 2015. The rise in life expectancy and economic growth in the 20th century. *The Economic Journal*, 125(584), pp.838-852.
- Ismail, N.W., Rahman, H.S.W.A. and Hamid, T.A.T.A., 2015. Does population aging affect economic growth in Malaysia. *Prosiding Perkem*, 10, pp.205-210.
- Kao, C., 1999. Spurious regression and residual-based tests for cointegration in panel data. *Journal of econometrics*, 90(1), pp.1-44.
- Kouton, J., N'guessan, C.F.J. and Ayivodji, F., 2018. Threshold Effects of Health on Economic Growth in Sub-Saharan African Countries: Evidence from a Dynamic Panel Threshold Model. *Journal of Economics*, 6(4), pp.19-37.
- Mahumud, R.A., Hossain, G., Hossain, R., Islam, N. and Rawal, L., 2013. Impact of Life Expectancy on Economics Growth and Health Care Expenditures in Bangladesh. *Universal Journal of Public Health*, 1(4), pp.180-186.
- Mahyar, H., 2016. Economic growth and life expectancy: The case of Iran. *Studies in Business and Economics*, 11(1), pp.80-87.
- Maddala, G.S. and Wu, S., 1999. A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and statistics*, 61(S1), pp.631-652.
- Ngangue, N. and Manfred, K., 2015. The impact of life expectancy on economic growth in developing countries. *Asian Economic and Financial Review*, 5(4), p.653.

- Piabuo, S.M. and Tieguhong, J.C., 2017. Health expenditure and economic growth-a review of the literature and an analysis between the economic community for central African states (CEMAC) and selected African countries. *Health economics review*, 7(1), p.23.
- Pedroni, P., 1999. Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and statistics*, 61(S1), 653-670..
- Pedroni, P., 2004. Panel cointegration: asymptotic and finite sample properties of pooled time series tests with an application to the PPP hypothesis. *Econometric theory*, 20(3), 597-625.
- Rengin, A. K., 2012. The relationship between health expenditures and economic growth: Turkish case. *International Journal of Business Management & Economic Research*, 3(1).
- Somayeh, H., Teymoor, M. and Bahadori Mina, S., 2014. Effect of health on economic growth: A panel data study of developed and developing countries. *European Online Journal of Natural and Social Sciences: Proceedings*, 2(3 (s)), pp.pp-1273.
- Sharma, R., 2018. Health and economic growth: Evidence from dynamic panel data of 143 years. *PloS one*, 13(10), e0204940.
- Shafi, R. and Fatima, S., 2019. Relationship between GDP, Life Expectancy and Growth Rate of G7 Countries. *International Journal of Sciences*, 8(06), pp.74-79.<http://www.ijSciences.com>
- Shkolnikov, V.M., Andreev, E.M., Tursun-Zade, R. and Leon, D.A., 2019. Patterns in the relationship between life expectancy and gross domestic product in Russia in 2005–15: a cross-sectional analysis. *The Lancet Public Health*, 4(4), pp.e181-e188.
- Zaman, S.B., Hossain, N., Mehta, V., Sharmin, S. and Mahmood, S.A.I., 2017. An association of total health expenditure with GDP and life expectancy. *Journal of Medical Research and Innovation*, 1(2), pp.AU7-AU12.

Public Debt and Economic Growth in Bangladesh: Evidence from Granger Causality

Ayesha Siddika*

Abstract: Whether the public debt is disastrous for accelerating economic growth in a developing country is an important empirical question in the present world. In order to analyzing the dynamic relationship between public debt and economic growth in Bangladesh, yearly data of Real GDP and external debt outstanding from 1970 to 2016 have been covered in this study. In this regard, multivariate time series techniques have been employed and it is found that public debt is cointegrated with economic growth in Bangladesh. This study finds a short-run as well as the long-run association between the economic growth and the public debt. Moreover, the results of this study also uncover that public debt causes the economic growth in Bangladesh. However, government should be careful of spending money and once prepares the deficit budget, reduce the dependency on the public debt, especially on the external sources.

Introduction

Having a significant amount of public debt is the common phenomenon of the least developed and developing countries in the present world. Most of these countries undertake deficit budget policy by thinking that this policy will in turn provide a greater benefit by accelerating economic activities. In order to financing the deficit budget, normally government of these countries rely on debt, and as a consequence public debt is increasing day by day. Bangladesh, which just overcomes its status from the least developed countries, is not an exception from this. Borrowing from the other countries is not always bad, rather economic theory advocates that moderate borrowing to cover deficit budget is good for an economy (Pereira, 2000). When the government uses these loans to promote economic growth by investing more in education and health to build a strong human capital base, in infrastructure, roads and highway, in social development, etc. then the country will enjoy the benefit of the public debt by eradicating poverty (Amakom, 2003) and enhancing individual well-being.

Bangladesh is a population abundant country with scarce resources so that it has to dependent on borrowing from other countries to cover the deficit budget. In the literature, a debate exists on whether it is good or bad to borrow from other. One group believes that persistent deficit budget sometimes fall the country into debt trap so that economic activities will stuck down as a result of high public debt (Islam and Biswas, 2005). This happens because in order to pay the interest of the debt government later increases taxes and VAT significantly that effects the purchasing power of the people. Another group supports the borrowing policy to cover the budget deficit, as they believe that when government becomes unable to cover the deficit budget from taxes and revenues then borrowing money becomes the available option to continue economic growth and development. But it is important that from where government borrow the money to cover the deficit budget. Because, if government take loans from the local bank then it will create an upward pressure on the interest rate so that the domestic investment will decline as a result of crowding out effect with high interest rate.

* Associate Professor, Department of Economics, Jahangirnagar University, Savar, Dhaka-1342
Email: asiddika12@juniv.edu

Basically, government can finance the deficit budget from four sources- (1) it can print new money, (2) it can borrow from domestic sources, (3) it can borrow from foreign sources, and (4) it can run down the foreign exchange reserves. Although Bangladesh has been using all these four options, borrowing from the domestic sources and foreign sources are still prominent. In this context, this study is an attempt to uncover the fact that whether public debt is good for accelerating the economic growth of Bangladesh or not.

Literature Review

A large number of studies had been conducted to identify the impact of public debt burden on the economic growth of a country throughout the world. In Bangladesh a several number of research studies had been done on the sustainability of public debt burden and on the crowding out effect.

Fosu (1996) examined the data of 13 severely indebted countries, “Zambia, Venezuela, Sierra Leone, Philippines, Peru, Morocco, Mexico, Kenya, Honduras, Egypt, Ivory Coast, Argentina and Algeria” by taking the data from 1971 to 1991. His study was employed OLS method on panel data and found that investment is inversely related to public debt. Using the yearly data of Pakistan from 1981 to 2008, Qureshi & Ali (2010) also found that public debt negatively affect the economy. Study of Hyman (2007), which was conducted by covering six Caribbean countries, also supports the conclusion that high debt deteriorate economic growth. Moreover, by using the yearly data of Egypt from 1981 to 2006, El-Mahdy & Torayeh (2009) also found that public debt causes to deteriorate economic growth in Egypt, and using the annual data of Nigeria from 1970 to 2007, Ogunmuyiwa (2011) no causality between these two. Study of Chowdhury (2006) also found the evidence on “Bulow–Rogoff’s proposition” that the external debts of developing countries are not a primary cause of economic slowdown.

According to a study of International Monetary Fund (2008), “Bangladesh’s risk of debt distress is low based on external debt indicators. Bangladesh’s external debt burden indicators do not breach the relevant policy-dependent indicative thresholds under the baseline scenario and exhibit only a marginal breach under the stress tests. Debt burden indicators are significantly worse when domestic debt is included. Accordingly, this analysis reveals a more elevated risk of debt distress on public debt compared to results based solely on external debt. Staffs will monitor closely the evolution of domestic debt and the government’s ability to mobilize domestic resources”.

Study of Majumber (2007) tried to analyze whether public borrowing of Bangladesh crowding-out private investment by employing multivariate time series techniques and found that instead of crowding-out, actually crowding-in effect exists in the context of Bangladesh, which implied increasing private investment consistent with increasing public debt.

Islam and Biswas (2005) revealed that debt-GDP ratio is sustainable in Bangladesh. Another empirical study on the debt sustainability of Bangladesh, made by Islam (2007), shows that “the differential between growth and interest rate, reduction in primary deficit, export growth and improvement of current account balance have stronger influence in changing the overall public debt-GDP and external debt-export ratios. The current debt level appears sustainable in Bangladesh. The paper suggests that either the interest rate on

debt or GDP growth needs to be maintained at levels such that the GDP growth- real interest rate differential may increase further”. According to Asian Development Bank (ADB), “An excessive level of public debt can make a nation vulnerable to interruption in aid flows or to sudden shifts in domestic financial market conditions. These problems are aggravated by a narrow export and production base and various structural, political, and institutional factors that reduce returns on investment” (ADB 2005). However, “the impact of public debt on investment and other economic indicators vary depending on a country’s extent of indebtedness” (Hashibul and Tahmina, 2012).

Budget Balance and Financing for Bangladesh

A clear guideline is provided by the “Public Money and Budget Management Act 2009” to maintain the budget deficit to a sustainable level. Therefore, government is conscious to keep the budget deficit within 5 percent of GDP. Table 1 shows the data of overall budget balance and financing of last few years:

Table 1: Overall Budget Balance and Financing

| | (As Percent of GDP) | | | | | | | | |
|---|---------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| Budget Balance/ financing | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
| Overall budget balance (excluding foreign grants) | -3.5 | -3.9 | -4.0 | -4.4 | -4.1 | -4.4 | -5.0 | -5.0 | -5.0 |
| Overall budget balance (including foreign grants) | -2.8 | -3.4 | -3.6 | -4.0 | -3.6 | -4.0 | -4.7 | -4.7 | -4.8 |
| Net domestic financing | 2.0 | 2.2 | 3.3 | 3.3 | 2.7 | 3.0 | 3.6 | 3.6 | 3.5 |
| Net foreign financing (excluding grants) | 0.8 | 1.3 | 0.4 | 0.7 | 1.0 | 0.9 | 1.1 | 1.5 | 1.4 |
| Net foreign financing(including grants) | 1.5 | 1.7 | 0.7 | 1.1 | 1.4 | 1.4 | 1.4 | 1.8 | 2.2 |

Source: Finance Division, M/O Finance and BBS. (Various issues of the Budget in Brief). Base year of GDP 2005-06.

Public Debt Management

The Government borrows from both domestic and external sources to meet the budget deficit in Bangladesh. Data on government domestic borrowing from different sources that the Government has paid back Tk.18,405 crore to the banking system in FY2016-17. On the other hand, in FY2015-16 the Government borrowed Tk.2,814.8 crore from the banking system. Besides, the Government borrowed Tk.53,689.2 crore from non-bank sources in FY2016-17. Therefore, the total government borrowing (net) from the domestic sources stood at Tk.35,284.2 crore in FY2016-17, which is 4.92 percent lower compared to FY2015-16.

Government Borrowing from External Sources

The budget of recent years shows a trend of steady decline of dependence on external assistance. But principal and interest repayment for received loans by Bangladesh is gradually increasing. Analyzing data from external sources, it is seen that in FY2016-17 amount of foreign resources stood at US\$3,531 million which is 0.93 percent less than the receipt of US\$3,564 million of previous fiscal year. At that time repayment of principal and interest was US\$1,144 million which was 8.21 percent more than the

previous fiscal year. Compared to FY2015-16, disbursement of FY2016-17 has decreased by 0.87 percent. On the other hand, debt service (principal and interest) expenditure of FY2016-17 has increased by US\$94 million compared to last fiscal year. As a result, net external assistance flow (after deducting principal and interest payment) in FY2016-17 has decreased by US\$127 million compared to last fiscal year (Bangladesh Economic Review, 2017).

Methodology

Data Description and Sources

Using annual data from 1974 to 2016, this study has investigated the dynamic relationship between public debt and economic growth in Bangladesh. To represent economic growth, the real GDP (RGDP) is used, and external debt outstanding is used to represent public debt, while these data are collected from World Development Indicators (WDI). Some secondary data are also collected from Bangladesh Bureau of Statistics, and Bangladesh Economic Review.

Table 2: Statistical features of the variables in log level

| | LNGDP | LND |
|--------------|----------|-----------|
| Mean | 24.48971 | 23.03250 |
| Median | 24.46033 | 23.42689 |
| Maximum | 26.21363 | 24.07548 |
| Minimum | 22.99034 | 20.03212 |
| Std. Dev. | 0.863490 | 0.940139 |
| Skewness | 0.262369 | -1.399219 |
| Kurtosis | 2.174713 | 4.395196 |
| | | |
| Jarque-Bera | 1.753490 | 17.92603 |
| Probability | 0.416135 | 0.000128 |
| | | |
| Sum | 1077.547 | 1013.430 |
| Sum Sq. Dev. | 32.06142 | 38.00601 |
| | | |
| Observations | 44 | 44 |

Summary statistics of the natural log of RGDP (LNGDP) and natural log of debt (LND) are decorated in Table-2, from where it is observed that the mean of LNRGDP is 24.48971 (with +/- 0.863490) and the mean of LND is 23.03250 (with +/- 0.940139). The “Jarque-Bera (JB)” statistic for the LNGDP is 1.753490 with the probability of 0.416135 (greater than 0.05). The p-value indicates here that the null hypothesis is true and LNGDP is distributed normally. Now, the JB statistic for the LND is 17.92603 and the p-value is 0.000128 (less than 0.05), which indicates that LND is not normally distributed.

The graph for this data set at the level form are illustrated in Figure-1. It is clear that the variables are moving together and upwards trending for the economy of Bangladesh.

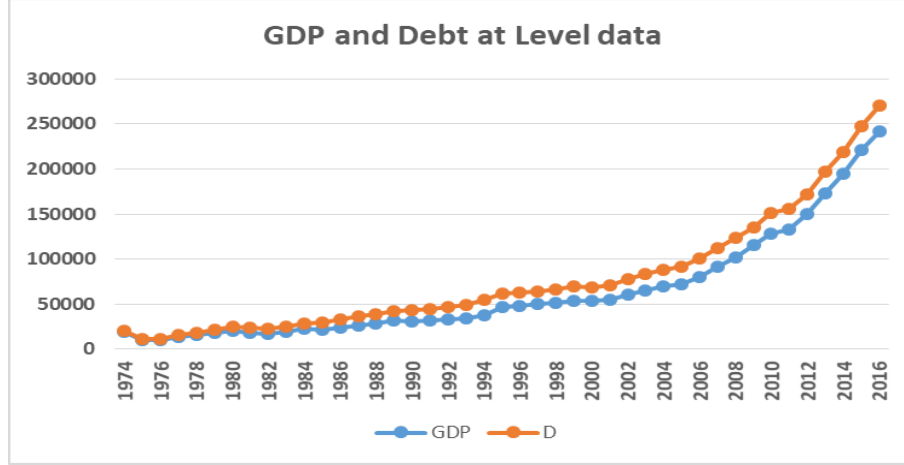


Figure 1: Level form of the selected variables

Specification of Model

This study applies the method of “Granger causality test” and the “Vector Autoregressive Model (VAR)” to estimate the effects of public borrowing on economic growth in Bangladesh. In order to test the causal relationships, the following model is specified:

$$RGDP = f(PD) \quad (1)$$

Where $RGDP$ = Real gross domestic product; and PD = Public debt. Public borrowing can be further specified as follow:

$$PD = f(EXTD, DD) \quad (2)$$

Where $EXTD$ = External debt outstanding; DD = Domestic debt; and for this paper to capture the stated objective, equation (1) for public debt-growth nexus is represented in a VAR model as:

$$RGDP_t = a_{10} + \sum_{j=1}^k a_{1j} RGDP_{t-j} + \sum_{j=1}^k b_{1j} PD_{t-j} + u_t \quad (3)$$

$$PD_t = a_{20} + \sum_{j=1}^k a_{2j} PD_{t-j} + \sum_{j=1}^k b_{2j} RGDP_{t-j} + u_t \quad (4)$$

Where: $RGDP_t$ = Proxy for economic growth

PD_t = Debt outstanding as a proxy for public debt

u_t = A zero mean white noise error term

For this paper to examine whether domestic or external debt that promotes economic growth, we disaggregate public debt into external debt and domestic debt.

Testing for Unit Root: The ADF test

This study applies the “Augmented Dickey Fuller (ADF)” test to investigate the unit root property of individual time series. The ADF test essentially runs the following regression:

$$\Delta y = \beta_1 + \lambda y_{t-1} + \delta_i \sum_{i=1}^n \Delta y_{t-i} + u_i \quad (5)$$

In equation 5, Y represents any time series variable under consideration, RGDP or PD, while Δy denotes first difference of the variable under investigation. Again, u is a white noise error term and n refers to number of lags chosen. The ADF test evaluates the hypothesis $H_0: \lambda = 0$, implying the time series has unit root. Rejection of $H_0: \lambda = 0$ reveals that the series is stationary, although series may become stationary in levels or in other higher orders.

Table 3: The results of ADF and Phillips and Perron tests are presented below

| Variable | ADF | | Phillips-Perron | |
|----------|--------|------------------|-----------------|------------------|
| | Level | First Difference | Level | First Difference |
| GDP | 3.1951 | -6.8989* | 6.6287 | -6.8283* |
| Debt | 1.7126 | -4.0064* | 2.4589 | -5.3236* |

* indicates at 1% level of significance

Table 3 shows that the time series are nonstationary i.e. $I(0)$ at their levels, while first difference makes them stationary. That is each of the series Debt and GDP are integrated of order 1, $I(1)$.

Cointegration Test

This study relies on the Johansen cointegration test to check the long-run association of the variables. Results are tabulated in Table 4.

Table 4: Results of multivariate cointegration tests

| Maximum rank | Eigenvalue | Trace statistic | Critical value | Max Statistic | Critical value |
|--------------|------------|-----------------|----------------|---------------|----------------|
| None* | 0.475239 | 28.30899 | 15.49471 | 27.08213 | 14.26460 |
| At most 1 | 0.28788 | 1.226858 | 3.841466 | 1.226858 | 3.841466 |

From Table 4, the trace-statistic and max-statistic tests of Johansen and Juselius (1991) suggest that the considered time series are cointegrated. This implies that there is stable long-run relationship between GDP and debt outstanding (PD) in Bangladesh. As the series are integrated in a same order i. e. $I(1)$, which confirms from the previous section, we may use the Vector Error Correction (VEC) model for the variables.

Testing for Causality:

To detect the nature of causality this study applies the “Granger causality test” (Granger, 1969) and the results are tabulated in Table 5.

Table 5: Granger Causality tests

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|-----------------------------------|-----|-------------|---------|
| LNPD does not Granger Cause LNGDP | 42 | 19.7039* | 0.00007 |
| LNGDP does not Granger Cause LNPD | | 0.99277 | 0.3252 |

In the Table 5, there is a unidirectional causality identified from debt outstanding (D) to GDP implies that the debt outstanding for the economy affects the economic growth for Bangladesh economy in the long run. The expansion in debt for the economy causes the burden for us and we have to pay the debt services for it, squeezes the economic activities and hamper the economic growth.

Vector Error Correction Model

To examine the short-run dynamic relationship between economic growth and public debt, Vector Error Correction Model (VECM) will be incorporated. The results of the unrestricted VECMs considering up to 1 lag for both economic growth and public debt are tabulated in Table 6.

Table 6: Vector Error Correction Estimates

| Standard errors in () & t-statistics in [] | | |
|--|------------|------------|
| Error Correction: | D(LNGDP) | D(LND) |
| CointEq1 | -0.001985 | 0.072643 |
| | (0.02083) | (0.01248) |
| | [-0.09534] | [5.82129] |
| D(LNGDP(-1)) | -0.190628 | 0.090163 |
| | (0.11920) | (0.07143) |
| | [-1.59920] | [1.26229] |
| D(LND(-1)) | -0.527218 | -0.131700 |
| | (0.20492) | (0.12279) |
| | [-2.57278] | [-1.07254] |
| C | 0.122824 | 0.086694 |
| | (0.02740) | (0.01642) |
| | [4.48314] | [5.28080] |
| R-squared | 0.358759 | 0.647943 |
| Adj. R-squared | 0.308135 | 0.620149 |
| Sum sq. residuals | 0.477647 | 0.171507 |
| S.E. equation | 0.112114 | 0.067181 |
| F-statistic | 7.086706 | 23.31238 |
| Log likelihood | 34.41220 | 55.92136 |
| Akaike AIC | -1.448200 | -2.472446 |
| Schwarz SC | -1.282708 | -2.306953 |

On the above table, CointEq1 is the error correcting term of the system and as it is negative and statistically significant, it indicates that this term is adjusting the error of the system.

From table 6 it is evident that public debt is negatively affecting the country's GDP growth, which is statistically significant at less than 5 percent level. This indicates public debt is a barrier for the GDP growth. It however, the existence of crowding out effect cannot be inferred with certainty as it is out of the scope of the model used in this study. When government faces crisis in funding, it is obvious and logical to cut the subsidy amount. These findings are only valid for short term and comply with the previous findings partly.

Recommendations and Conclusion:

In order to financing the deficit budget, normally government of the developing countries rely on debt, and as a consequence public debt is increasing day by day. Bangladesh, which just overcomes its status from the least developed countries, is not an exception from this. Borrowing from the other countries is not always bad, rather economic theory advocates that moderate borrowing to cover deficit budget is good for an economy (Pereira, 2000). When the government uses these loans to promote economic growth by investing more in education and health to build a strong human capital base, in infrastructure, roads and highway, in social development, etc. then the country will enjoy the benefit of the public debt by eradicating poverty (Amakom, 2003) and enhancing individual well-being. In order to analyzing the dynamic relationship between public debt and economic growth in Bangladesh, yearly data of Real GDP and external debt outstanding from 1970 to 2016 have been covered in this study. In this regard, multivariate time series techniques have been employed and it is found that public debt is cointegrated with economic growth in Bangladesh. This study finds a short-run as well as the long-run association between the economic growth and the public debt. Moreover, the results of this study also uncover that public debt causes the economic growth in Bangladesh. However, government should be careful of spending money and once prepares the deficit budget, reduce the dependency on the public debt, especially on the external sources.

References

- Amassoma, D., "External Debt, Internal Debt and Economic Growth Bound in Nigeria using a Causality Approach". *Current Research Journal of Social Sciences* 3(4): 320-325, 2011.
- Augustin. (1996). *The Impact of External Debt on Economic Growth in Sub-Saharan Africa. Journal of Economic Development*. Gunter, B. G., & Rahman, A. F. (2008). Analyzing Bangladesh Bank. Bangladesh Bank, Various issues of *Economic Trends*, Dhaka, Bangladesh BSS (Bangladesh Bureau of Statistics). Various Issues. *Statistical Yearbook of Bangladesh*
- Bangladesh's Debt Sustainability. *Bangladesh Development Research Working Paper Series*
- Chowdhury, K. (2006). A structural analysis of external debt and economic growth: some evidence from selected countries in Asia and the Pacific. *Cited on 4th June, 2013*
- El-Mahdy, M. A., & Torayeh, M. N. (2009). Debt Sustainability and Economic Growth in Egypt. *International Journal of Applied Econometrics and Quantitative Studies*, 6-1.
- Fosu, A. K., "The External Debt-Servicing Constraint and Public Expenditure Composition: Evidence from African Economies". UNU-WIDER. Research paper No. 2007/36, 2007.
- Granger, C. W. T. and P. Newbold. 1986. *Forecasting Economics Time Series*, Second Edition, Academic Press, Inc., Orlando, Florida.

- Gujarati, D. N. 2003. *Basic Econometrics*, Fourth Edition, McGraw-Hill Inc., New York. pp: 23-26.
- Hyman, R. (2007). The Impact of High Debt Burdens on Small Caribbean States. *International Research Journal of Finance and Economics*.
- International Monetary Fund. (2008). *Joint Fund-World Bank Debt Sustainability Analysis (DSA)*. International Monetary Fund and International Development Association.
- Islam, Md. E. & Biswas, B.P. (2005). Public Debt Management and Debt Sustainability in Bangladesh. *The Bangladesh Development Studies*, Vol. XXXI, No. 1 & 2.
- Islam, Md. E., (2007). Public Debt Sustainability in Bangladesh. Cited on 4th June, 2013 from the website <http://www.ssrn.com>.
- Majumder, M. A. (2007). Does Public Borrowing Crowd-out Private Investment? *Working Paper Series, Policy Analysis Unit, Bangladesh Bank*.
- Ogunmuyiwa, M. (2011). Does External Debt Promote Economic Growth in Nigeria? *Current Research Journal of Economic Theory* (29-35).
- Panizza, U., Presbitero, A. (2013), Public Debt and Economic Growth in Advanced Economies: A Survey. *Swiss Journal of Economics and Finance*, Vol. 149, No. 2, pp. 175–204.
- Panizza, U., Presbitero, A. (2014), Public Debt and Economic Growth: Is There a Causal Effect? *Journal of Macroeconomics*, Vol. 41, pp. 21–41.
- Pescatori, A., Sandri, D., Simon, J. (2014), Debt and Growth: Is There a Magic Threshold? *IMF Working Paper* 14/34.
- Puente-Avojin, M., Sanso-Navarro, M. (2015) Granger Causality between debt and growth: Evidence from OECD countries. *International Review of Economics and Finance*, Vol. 35, pp. 66–77.
- Rangarajan, C., Aupam Basu and Narendra Jadhav (1989), 'Dynamics of Interaction between Government Deficit and Domestic Debt in India', RBI Occasional Papers, Vol. 10.3, September.
- Qureshi, M. N., & Ali, K. (2010). Public Debt Burden and Economic Growth: Evidence from Pakistan. *International Research Journal of Finance and Economics*.
- Stiglitz, J.E., "Economic of the Public Sector: Third Edition" New York and London, W.W. Norton & Company, p790, 2000.
- Teles, V., Mussolini, C. (2014), Public debt and the limits of fiscal policy to increase economic growth. *European Economic Review*, Vol. 66, pp. 1–15.

Internet Memes and Normalisation of Sexism in the time of Covid-19

Zobaida Nasreen*
Muhammad Ahsan Habib**

Abstract: In the time of Covid-19, the stay-at-home orders to contain the spread of the virus forced most people to remain indoors for the first time in contemporary history. As the patriarchal machines retreated to the home and were sitting still, the hegemonic domination within the domestic space did not pause, rather it found an outlet in virtual space. With more people spending significantly longer time online than ever before, it was also a time when many of them were openly prepared to share sexist memes and jokes, which indicates a public acceptability of casual sexism. In this article, we explore the sexist content of 35 online memes. Our focus here is on individual will and action of men and women rather than structural sexism in online space. Our analysis demonstrates that sexist memes and jokes during the pandemic reinforced patriarchy even when it retreated to domestic space and continued to dehumanise women as sexual objects and devalue their abilities. Implications of such jokes and humour are discussed.

Keywords: Internet memes, sexist jokes, humour, casual sexism, online misogyny, social media, Covid-19, pandemic, feminism

Introduction

Though unprecedented in contemporary history, most people—men, women, and transgender—were forced to remain indoors for the most part of 2020 due to Covid-19 pandemic. Staying with family for such a long stretch of time was unique. Yet, instead of human solidarity developing, the internet culture came out to be more frequently sexist and misogynistic than before, with a wide range of stories, messages, images, and videos being posted every day despising women and transgender people. The sheer persistence of online sexism in the form of internet memes was staggering. Interestingly, these sexist acts were no longer done by some unknown abusers hiding behind a virtual screen but living in the comfort of their homes and displaying their names and identities without making any attempt to mask themselves. It suggests that the modern day sexism and misogyny in online platforms became even more normalised, or the “new normal”, during the pandemic.

At the outset, we need to clarify what online sexism is and how it reproduces contemporary gender regimes in an increasingly mediatised society. Though the term “sexism” is generally defined as “prejudice or discrimination based on sex or gender, especially against women and girls”¹, in recent times it has also been used to include the oppression of transgender people. In a world rife with sexism, many people are now openly expressing insensitive, derogatory or biased sexism online. The manifestations of sexism vary widely depending on the landscape of their operation. Sometimes they can be blatant, when the production of difference based on sex or gender is violent, or sometimes they can be subtle, when it is wrapped in “humour” and “joke”. Nonetheless, all sexist manifestations share the characteristic that they are deeply rooted in patriarchy.

* Associate Professor, Department of Anthropology, University of Dhaka, Email: zobaidanasreen@du.ac.bd

** Journalist, Translator, and Editor, Email: ahsanhabibsohel@gmail.com

Apparently, stereotyping and misogyny ingrained in memes are a minor issue. When these sexist acts or views are pointed out or challenged, the usual response is that it is “just for fun” or “haven’t you got a sense of humour?” Such a euphemistic reaction sends the message that it is a trivial or harmless thing, and the often spontaneous nature of subtler sexism makes it even harder for the victims to be not taken seriously. It is too often a matter of interpretation, and so the perpetrators can easily claim misinterpretation excuses. There is also a strong tendency to view sexism as an opinion, which in effect leads to the conclusion that anyone is entitled to their sexist beliefs and expressions. All these suggest that there is a public acceptability of sexism, and the expectation is that the women should stop complaining and accept it as a joke. After several decades of feminist struggles, many people started to acknowledge the problem of sexism, but the age of the social media has changed the direction. When the social media was introduced, only a handful of people would show sexist aggressions against women, but they would try to hide behind masks. Over time, things have changed. The instantaneous and unrestricted reach provided by the social media allows latent and underlying sexism to appear, and now sexism, misogyny, and patriarchy are again getting more ingrained, especially in many users’ everyday online behaviour without much fuss from either men or women.

In the pre-Covid times, the issue of casual sexism was focused primarily on minor sexist aggressions on the streets and public places, which are the sites of ‘real’ incidents, it has now moved virtual for women. The traditional outer spaces—where patriarchal machines are fully operational—have little, but increasingly expanding, spaces for women. In contrast, women in general have a strong presence in newly emerging virtual social spaces as they tend to use social media more than men². Due to such a high level of women’s participation, the virtual social spaces can potentially offer a more inclusive “public sphere” than as originally conceived by Habermas (1989). Yet, they are far away from becoming inclusive, as masculinity is found deeply embedded within the internet culture. In the digital age, online sexism, being an integral part of modern patriarchal knowledge reproduction systems, has strong consequences for women and transgender people in both virtual space and community. When women and transgender people are either idealised or dehumanised in online platforms, new restrictions and limitations are imposed on their bodies and their lives. It creates new processes of othering and exclusion which push those groups to the margin. This is why it is important to reflect properly on the ideological functions of online sexism in maintaining masculine domination.

In this article, we explore the sexist nature of 35 internet memes that were produced and shared in the social media during the pandemic. Our focus here is on individual will and action of men and women rather than structural sexism of virtual space. Through discourse analysis, we examine the manifestations of gender stereotypes and cultural norms in memes and explore how they contribute to masculine pleasure and dilemmas.

Memes, sexism and social distancing

In recent years, the virtual space has grown enormously and has become one of the main sites for reproducing and circulating sexist jokes that belittle women and trivialise unequal social relations under the guise of benign amusement. Many people casually post offensive memes about women and transgender people. Given the social media’s ever-

expanding and essential presence in our daily life, the relationship between communication technology and sexism is coming under more scrutiny than ever before. Some communication scholars have explored the intersection between gender and power online (Herring 2008; Foster 2015). The meme-terrain grew on the back of the technological developments that transformed the way people share jokes, and the mostly anonymous nature of memes is partly a reason for their success.

Lockdown, quarantine and other measures taken by the government to contain the spread of Covid-19 accelerated memes' move into the mainstream internet culture in Bangladesh. Though not a new phenomenon, memes drew renewed attention and emerged as a form of digital mass media during the pandemic due to the unprecedented expansion of social media. However, this enormous change also facilitated the spread of hegemonic masculinities. It was a new development in the sense that many young people, previously confined to private or closed groups, found new outlets to forge their patriarchal ideas in the form of online networks and then spread and live those in the real world. Interestingly, a large part of the distributed memes were visibly hostile toward marginalised people, including women, who form a huge section of their audience. A set of memes were transphobic, some even went as far as questioning whether they were really human beings. These manifestations show that sexist memes place real and imagined barriers based on sex or gender to exclude these people from enjoying the internet's original emancipatory promises. Instead of giving voice to the voiceless or developing inclusive digital spaces, governed by the ideals of democratic, openness and transparency, it unleashes a new path rooted in the online platforms for the growth of gender-based inequality.

To explain the reasons behind the recent explosion of sexist memes, it is important to look at the processes through which memes communicate meanings. Memes work broadly through the processes of appropriation and recontextualisation. In the usual lifecycle of memes, a harmless image or idea is appropriated and then repositioned in a new context to make maximum impact. Memes, ideal for visually communicating lighter content, are not funny unless they are recontextualised. However, pulling a benign image or idea out of its specific context and placing it in front of a much larger audience allows it to acquire a new meaning, something that is potentially dangerous and chaotic. This is usually the case because the debasement that occurs reflects certain negative values of the dominant ideologies. A reverse recirculation is also possible, as exemplified by the counter-culture memes carrying feminist and anti-racist messages. However, those attempts have so far been marginal in the history of memes.

Memes communicate meaning by virtue of generating humour and laughter. To be able to pass off as humorous is a key criterion for the memes' reproducibility. Being a new entry in the tradition of humour, memes play a similar social function as humour: they are simultaneously uniting and divisive social activity (Fine 1976; Meyer 2000). Memes, just like jokes and humour, decrease social distance (Coser 1959); play an important role in uniting interlocutors (Coser 1959; Fine 1976; Meyer 2000); have participants in 'agreement about the social world' (Critchley 2002). While jokes and humour aid in social affiliation and group formation, memes focus more on differentiation, rather than on the social. Memes' lifecycle is premised on endless hierarchical distinctions, making them divisive and capable of generating and reinforcing social boundaries, social

distance, and inequalities (Billig 2005; Meyer 2000). To further elucidate how sexist memes reproduce deeply embedded masculine worldview, we argue that the main tendency of a meme is rarely to capture the complexities of social relations, but to ridicule them, which can be utilised to target, discipline, marginalise, and alienate groups and individuals who are ‘othered’ (Billig 2005; Lockyer and Pickering 2005; Weaver 2011; Pérez 2017). Hence, sexist memes propagate marginalised positions for gender ‘other(s)’ by reinforcing the existing societal power imbalance. Critchley (2002) elaborates that most humour “... in no way seeks to criticise the established order or change the situation in which we find ourselves... much humour seeks to confirm the status quo either by denigrating a certain sector of society, as in sexist humour, or by laughing at the alleged stupidity of a social outsider”. Thus, humour can play a “socially normative role” (Butler 2015) by ridiculing an individual’s identity or behaviour.³ Given that the joke-sharing practices utilise sexist and racist content, sexually inappropriate, misleading, and offensive language and imagery every day (Castella, 2011) to elicit positive emotional reactions like joy and laughter, online jokes embody a strong potential to offend rather than entertain (Lockyer and Pickering 2005). “Ironic poisoning”, or online ironic memes having realworld consequences, sometimes violent, is also a matter of growing concern among digital media scholars⁴. If we consider historic and continued inequities and discriminations against women, it will make more sense why the jokes in which men ridicule women are more consequential, socially and politically, than those in which women ridicule men.

Memes problematise the issue of sexism, making its manifestations generally seem inevitable, a historical, culturally transcendent and uniform. Thus, sexism does not remain context-specific, and nobody is required to take responsibility for it. Again, they also appear to be ideas of isolated individuals, not a tool of social domination.

Fraser (2013) has offered a balanced feminist remedy to sexism which she formulates as “a two-dimensional mode of subordination, rooted simultaneously in the political economy and status order of capitalist society”. For women, she argues, sexism results in trivialising, objectifying, and demeaning stereotypical depictions, exclusion or marginalisation from public spheres, and denial of full rights and equal protections of citizenship. She calls these harms ‘injustices of misrecognition’ and contends that they are relatively independent of political economy. Thus, Fraser (2013) proposes that remedying sexism requires eliminating sexist stereotypes and breaking the cultural association of breadwinning with masculinity and a “feminist politics of redistribution”.

Men’s retreat to homes and the feeling of unease

From the last week of March 2020, the government of Bangladesh instructed the cessation of all public events, religious, political and cultural gatherings, and all educational institutions and other public engagements were shut down, with majority of the people who devoted most of their time in the public moving back into the domestic spaces for an uncertain period. Governmental and non-governmental organisations were on general holidays from March 27, 2020 through May 26, 2020, before starting to reopen with restrictions. As many male world leaders adopted the war metaphors to describe the COVID-19 threats, the female prime minister of Bangladesh also embraced the rhetoric—a terminology that largely excludes women—before laying out plans to fight the challenges of the pandemic.

The Covid-19 pandemic caused a global interruption of unprecedented nature and initiated a Working from Home (WFH) work culture across the world. In an opinion piece, Nasreen (2020) have explored how this great shift of workplace had different implications for men and women. It was a time when the whole family was forced to stay indoors for a long stretch of time. However, it was difficult for many men to accept being forced to remain indoors as they were not used to consider home as men's domain. The WFH times, when mostly middle-class families must manage without their domestic helps, encouraged men to share the burden of domestic work more equitably than they did in the past (Deshpande 2020). Since in South Asian countries, especially in India, Bangladesh and Pakistan, the most unequal norms of sharing domestic chores and housework have been observed (Deshpande and Kabeer 2019), the WFH situation could fuel little changes in the domestic work-sharing culture for most men. While bored and angry men sitting at home found an outlet in virtual social space to express themselves, women had to accept additional burden of caring for more people and for longer hours during the lockdown on top of their regular WFH and managing daily chores⁵.



Figure 1: “5 days at home listening to wife” (collected from Twitter)

The Figure 1 shows a man with disproportionately long ears with a text caption overlaid: “5 days at home listening to the wife”. This meme went viral in social media during the early days of Covid-induced lockdown. It forges the idea that a woman is so nagging and annoying that the husband's ears grew oversized just after listening to her constant complaining for five days. Such memes made people laugh and received thousands of ‘like’ or ‘love’ reactions on Facebook and Twitter. Though this meme apparently seems funny, it is not power-neutral, rather it is dehumanising and insulting for women. It plays into the power imbalance between women and men, a kind of a sexist politics⁶. Indian film star Rishi Kapoor shared the meme on Twitter, adding the caption: “On a lighter note! Side effects of the Coronavirus”. It did not go down well with some users who labelled it misogynistic and sexist⁷.

The lockdown was frustrating not just for men but people across the gender spectrum. In the memes, however, it was almost always the men who were getting bored and losing interest in everything there was at home – watching television, playing indoor games, or communicating with friends and families via digital platforms. Men’s reluctance to engage in household chores often received celebratory treatment in the memes. In contrast, women overloaded with additional household responsibilities for the pandemic became the subject of ridicule and laughter. These trend was well exemplified in the memes about men showing discomfort in household tasks like cooking, cleaning, washing and so on. We found memes in which the man was seen threatening to divorce his wife for requested him to help her with washing clothes, which is traditionally considered a women’s job. Suchmemes often portray a wife’s request for help as nagging in order to undermine the request and belittle what women are trying to say.



Figure 2: “Maintain good relationship with your wife. It seems new lockdown is coming soon”. (collected from Facebook)

A set of memes present a view of gender relations in which women are perceived as seeking to control men in an altered situation. While the demand of staying at home all day long goes against the masculine characterisation of men as strong, superior and breadwinner, as the conventional gender relations associate women to the home and men to the outside world, it was expected during the lockdown that neither should go out. But it was difficult for men to lock their masculine supremacy inside home. Hence, men are shown in memes to be desperate for breaking out of their homes, sometimes a metaphor of prison for them with women as the warden, instead of trying to reorient themselves in

their new roles at home in a lockdown situation. As a meme goes, a male police officer stops a man and asks why he is outside during lockdown, the man responds that his wife have thrown him out. In response, the officer asks if she is his real wife. The officer sympathises with the man's situation and accepts his excuse, and thus their masculinity is reinforced at his wife's expense. Here, the wife exercises power over the man who is frightened of her at home. Moreover, another set of memes highlighted the sufferings of men at home and their helpless efforts to adjust. Some memes were even asking women to be polite, accommodating and submissive to men so that their life at home became bearable. Here is a meme (Figure 2) that takes it even further with the wife being visibly violent at her husband's reluctance to cope with the new situation. The text overlaid in Figure 2 says, "Maintain good relationship with your wife. It seems new lockdown is coming soon". Here, the woman is portrayed as cruel, ruthless and dictatorial. It also hints at how painful an experience it is for a man to remain confined at home with the wife 24 hours a day. Married men after all are not socially expected of spending the entire day with the person they married. So the frustration finds expressions in memes that suggest some men prefer contracting the virus over remaining confined with the wife and children.

As the patriarchal machines retreated to the home, the hegemonic domination within the domestic space did not pause, rather it found an outlet in virtual space. With more people spending significantly longer time online than ever before, it was these frustrations that they vented out on Facebook in the form of openly sexist jokes. Though these memes may seem just a reaction to the new realities of the pandemic that have shaken conventional masculinities, they are not new but a condensation of earlier patterns or trends of sexism.

Mocking women's body and self in memes

Quarantine or lockdown was a whole new experience for both men and women. Many men adapted to the new situation by expressing amusement at sexist memes and jokes, which would help them appear more masculine and distance themselves from traits they did not want to be known for. A research conducted by the Center on Gender Equity and Health of the University of California San Diego showed that there was a substantial increase in the daily percentage of misogynistic tweets during the pandemic⁸. At the initial stage of the lockdown, a set of memes directed at women's body emerged, with some brooding over how women and girls were getting ugly while the others preoccupied with how "sexier" they would become for the lockdown. For the former group, the general arguments were like: because women and girls were staying home and not making usual efforts to look beautiful, they were getting ugly. When they would come out of the lockdown and get out of home, nobody would be able to recognise them. Some memes extended even further and suggested that women and girls would gain weight sitting idle at home, and some poked fun at feminine helplessness by showing that women grow facial hairs and look ugly after weeks of quarantine with no beauty parlour open. Not that men were immune to these lockdown realities, but they were rarely portrayed to gain fat or grow facial hairs. Here, negative body talk and shaming of women for the way they look are the tools of imposing patriarchal bodily control over women. For the latter group, women would become slimmer and more beautiful by losing body fat due to the reality of working extra hard to manage household chores on their own in absence of any domestic help for the lockdown. While these memes point to

the invisible labour in the women's household works, they simultaneously discourage men from sharing housework by essentially associating housework with women and thus contribute to the reproduction of gender inequality in the household.

One of the key features of sexist memes was the characterisation of women as less capable than men, especially women were deemed intellectually inferior and, by extension, not to be taken seriously. This bias finds expression in the following meme (Figure 3) with the text caption overlaid: "The world's first fortunate husband who shuts his wife's mouth immediately after marriage". This meme forges the idea that women do not really say anything serious or significant. The suggestion that women cannot deal with serious issues does not encourage the feeling that they can lead and simultaneously implies that they are best suited for conventional gender roles associated with the kitchen and the home.



Figure 3: A viral meme taken from Facebook

In some instances, the concept of "feminine weakness" is utilised to reassert gender domination, while in others women are portrayed as sinister, dangerous, and tragic to put forward narratives of masculine supremacy. A meme reflecting household pressure came out in the early stage of familiarity with the virus, when many prejudices and stigma were circulating towards Covid-infected patients. In that meme, a wife threatens her husband that she will call the emergency services to tell them that her husband has been infected with COVID-19 if he refuses to wash the clothes and dishes. We also came across memes that draw similarities between women and Covid-19. The text overlaid in a meme nods at the view that the nature of coronavirus is like the wife who at first seemed like easily brought under control, but later it became clear that the only way open was to negotiate with her. This meme reinforces the idea that the wife should be controlled by the husband. Trolling campaigns with memes, especially against famous women figures, reached new heights during Covid-19 period. Women were not spared even after death. Trolls went into overdrive after the death of two women celebrities, a film actor and a

singer, and memes surfaced attacking their religious beliefs, dress preferences and even their children's appearance. Such trolling campaigns were another manifestation of the patriarchal power in society.

Apart from the dehumanising and insulting attributions of being talkative, irritating, nagging, always-on-makeup, sexist memes reduce women to 'ultra-feminine' or domineering characters who are either too possessive of the husband or excessively controlling. While sexist jokes and memes are dehumanising and demeaning for women, they also contribute to masculine dilemmas which we will discuss in the following section.

Masculine dilemmas

Many people initially wondered why men were getting more infected by the virus. When the lockdown measures were implemented the scenario remained unchanged. It was understandable that men were going out more than women, but why was the infection rate disproportionately high for men? One possible explanation could be the masculine dilemmas of not being associated with home or private sphere—it was hard for men to negotiate with their masculinity to confine themselves within the boundary of a home for the entire day. The altered domestic reality demanded of them to be more accommodative with household works, but the patriarchal ideology—reinforced through sexist memes, jokes, texts and videos, among other activities—was pushing them in the opposite direction.

The functioning of masculinity was also complex during the pandemic. We encountered some memes that depicted men's attempt to negotiate with household works. In Figure 4, it is seen that a man in shirt and tie is taking part in a zoom meeting using a mobile phone while cleaning the floor with a broom. It was not merely his posture that invited laughter in social media, but also the fact that the people in Bangladesh do not usually relate a white collar male professional with house cleaning.



Figure 4: Zoom meeting and housework for men (collected from Facebook)

However, the manifestations of masculinities varied widely, and sometimes in contradictory ways. As Nasreen and Caesar (2020) highlights, many men who share household burdens may not wish to admit it to friends or the public for fear of masculine backlash or “masculine shyness”⁹. Therefore, we are not sure how and in what form masculinity will work since it is very often much fluid.

Reiterating masculinities

“Few tasks are more like the torture of Sisyphus than housework, with its endless repetition: the clean becomes soiled, the soiled is made clean, over and over, day after day. The housewife wears herself out marking time: she makes nothing, simply perpetuates the present... Eating, sleeping, cleaning – the years no longer rise up towards heaven, they lie spread out ahead, grey and identical. The battle against dust and dirt is never won.” – Simone de Beauvoir, *The Second Sex*, p 451-452

During the Working from Home (WFH) period, working women in Bangladesh had to take on additional burdens on top of their dual responsibilities of the job and usual household management. They had to look after children for longer period of time. Detached from friends and without any outdoor activities, they would frequently feel bored at home, and it was mostly women’s duty to keep them busy, manage their anger and help them cope with the new home routine. Women burdens would increase if the household included external family members, for there would more distractions for women. The presence of an elderly, disabled and/or persons with autism in the household would further complicate things for women.

The effect of the virus containment measures was quite different for men and women¹⁰. Working from home with care responsibilities made life more difficult for women. Due to the virus, combined with those measures, more people, especially older people and children, were needed to be cared for. In lockdown, it was not expected that men staying would suddenly change their attitude and start taking major responsibility for childcare. For many women and gender diverse people, the “stay home” directive meant they were wedged with a bored and angry partner or others who were abusive and violent. “Stay home” had not only served to increase the incidents of domestic abuse but also made curative access to medical and mental health support perplexing (Gupta 2020). In Bangladesh, gender-based violence increased significantly as women had no way to escape staying with their abusers due to exhaustive lockdown. A survey conducted by Manusher Jonno Foundation (MJF) confirmed the rise in gender-based violence, showing 672 women experienced domestic violence for the first time during the lockdown. Job loss, anxiety and uncertainty resulting from Covid-19 increased the possibility of conflicts between partners (MJF 2020). To further our understandings of how this sudden increase in domestic violence relates to memes or jokes shared on Facebook or Twitter, and how the seemingly ‘unserious’ practice of onlinememe-sharing can contribute to the reinforcement of patriarchal gender relations, especially when both men and women are asked to work from home, we argue here that a sexist public joke initiates a process through which sexism and other associated terms start to lose their meanings, making objecting to such acts more difficult. Nasreen (2020) elaborates, “laughability and unserious nature of jokes make them more ‘likeable’ than to be rejected: when a lot many

people ‘like’ masculine jokes reiterating patriarchal ideology instead of gender equality in the household, it further embeds existing societal perceptions of gender relations and makes confronting that ideology even harder”. Many women would put up with these events and never complain as the events are so normalised that to protest at each one may feel trivial and do not seem exceptional enough to object to. This lack of rejection gives the message that the gender roles should be governed through the lens of masculine ideology.

Conclusion

In this article, we focused on the sexist memes shared on social media, particularly on Facebook and Twitter, during the Covid-19 pandemic to uncover the power of memes within society and their effects on gender relations. Noting that memes and jokes are not an ‘unserious’ apolitical issue but media of reproducing and reinforcing power, we have explored masculine power through examining some instances of representation of women’s and their stereotypical gender roles in sexist memes. We have argued that sexist jokes are not “just jokes”, “free expression” or “opinion”, rather they reproduce and reinforce masculine power and pleasure in the form of “like”, “laugh” and “share”. We have tried to unpack how these jokes contribute to re-invigorating masculinity in the household when extra housework was the reality and draw a connection between sexist representation of women and domestic violence. We have also highlighted that the men who were not used to share responsibilities at home needed to cope with the new work-life pattern for Covid-19, and that the men’s failure to negotiate with masculine expectations in a transformed reality have mostly contributed to the rise in domestic violence during the pandemic.

During the Covid-19 lockdown, the explosion of sexist memes makes many people to think that online sexism and hatred of women is an acceptable part of public discourse. These events of sexist public ‘humour’ show that sexism and misogyny are not the things of the past, they are here, now and thriving. The examples we discussed here also highlight the prevalence of sexist rhetoric taken up by ordinary people very close to home. The impact of such sexism is potentially devastating. Online sexism has a silencing effect on women as they are often forced to change the way they use social media¹¹. Sexist memes reinforce the relationship of subordination and reiterates the position of sexual object. Social media has thus far been structurally incapable of tackling sexism, and it has also failed to offer practical and emotional help to those who suffered sexism. We have rarely seen any solidarity for the women victims from other women or men unless it was a strongly aggressive event. The social space created by social media has thus far been an unequal setup for women. As Artificial Intelligence and machine learning have started to transform the way people conduct their lives, urgent actions are required now to tackle sexism and misogyny. If machines are feed the data with sexist and other tendencies of hatred, which are prevalent in social media, then Artificial Intelligence “can corrupt the way software makes decisions, effectively immortalising” (Bano 2019)¹² those ideologies of hate in cyberspace, making the struggles for a fairer society even harder.

In the time of Covid-19, women and transgender people were the real and imagined victims of sexism. Responding to such sexism depends on the landscape in which they

operate. Sexism in memes is hard to confront as such a manifestation of sexism – despite operating in an individualising digital domain – does not generally assign anybody the responsibility for it. Sometimes the real and imagined victims quietly endure sexism when responding seems futile or even aggravating, and sometimes they fight back, demanding their rights and dignity. Any vision of emancipation must fight sexism in all its endless variation, and strive toward making internet a non-sexist space free from sexist oppression and violence. However, this fight should not be the responsibility of the victims alone. It needs to be fought within communities and in online platforms, individually and collectively. Resistance to dominant sexist practices and attitudes has the potential to actively reconfigure the unequal sex/gender-based power relations as well as the landscape in which they operate.

Reference

- Billig, M. (2005). *Laughter and Ridicule: Towards a social critique of humour*. Sage.
<http://dx.doi.org/10.4135/9781446211779>.
- Butler, N. (2015). 'Joking aside: Theorizing laughter in organizations', *Culture and organization*, 21(1): 42-58.
- De Beauvoir, Simone. (1949). *The second sex, woman as other*. London: Vintage.
- Ding, Z. (2015). *The internet meme as a rhetoric discourse: Investigating Asian/Asian Americans' identity negotiation* (Doctoral dissertation, Bowling Green State University). Retrieved from https://etd.ohiolink.edu/pg_10?::NO:10:P10_ETD_SUBID:102689
- Deshpande, A. (2020). 'What Does Work-From-Home Mean for Women?' *Economic and Political Weekly*, Vol. 55, Issue No. 21. <https://www.epw.in/node/157001/pdf>. (Last accessed on 28 July 2020)
- Dhrodia, A. (2017, November 23). Social media and the silencing effect: why misogyny online is a human rights issue. *New Statesman*. Retrieved from <http://www.newstatesman.com/>
- Ford, Thomas E., Julie A. Woodzicka, Shane R. Triplett & Annie O. Kochersberger. (2013). Sexist Humor and Beliefs that Justify Societal Sexism. *Current Research in Social Psychology* September. 64–81.
- Ford, Thomas E., & Ferguson, Mark A. (2004). Social consequences of disparagement humor: A prejudiced norm theory. *Personality and Social Psychology Review*, 8, 79-94.
- Foster, M. D. (2015). Tweeting about sexism: The well-being benefits of a social media collective action. *British Journal of Social Psychology*.
- Freud, S. (1976) *Jokes and their relation to the unconscious*, Penguin: London.
- Friedan, Betty. (1963). *The Feminine Mystique*. W. W. Norton and Co.
- Habermas, J. (1989) *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society* (Trans. by Burger T. with the Assistance of Lawrence F.). Polity Press, Cambridge.
- Harlow, S. (2013). It was a Facebook revolution": Exploring the meme-like spread of narratives during the Egyptian protest. *Revista de comunicación*, (12), 59-82.
 Retrieved from <http://udep.edu.pe/comunicacion/rcom/pdf/2013/Art059-082.pdf>
- Herring, Susan C. (2008). 'Gender and Power in Online Communication'. In Janet Holmes and Miriam Meyerhoff (eds) *The Handbook of Language and Gender*. Oxford: Blackwell.
- Josephine Ahikere and Amon Ashaba Mwiine (2020).
<https://blogs.lse.ac.uk/wps/2020/05/06/what-a-viral-video-of-gender-based-violence-tells-us-about-conflict-affected-northern-uganda/>

- Lewis, H. (2020, March 19). The Coronavirus Is a Disaster for Feminism. *The Atlantic*. Retrieved from <http://www.theatlantic.com/>
- McGhee, P. E., & Duffey, N. S. (1983). Children's appreciation of humor victimizing different racial-ethnic groups: Racial-ethnic differences. *Journal of Cross-Cultural Psychology*, 14(1), 29-40.
- Martin, C. E., & Valenti, J. (2013). # Femfuture: online revolution, new feminist solutions. Retrieved from <http://bcrw.barnard.edu/publications/femfuture-online-revolution/>
- Masequesmay, G. (2020, May 28). Sexism. In *Encyclopedia Britannica*. Retrieved from <https://www.britannica.com/topic/sexism>
- Millett, Kate. (1971). *Sexual politics*. UK: Virago.
- Moody-Ramirez, M., & Church, A. B. (2019). Analysis of facebook meme groups used during the 2016 us presidential election. *Social Media + Society*. <https://doi.org/10.1177/2056305118808799>.
- Nasreen, Z. (2021). 'Have You Not Got a Sense of Humour?': Unpacking Masculinity Through Online Sexist Jokes During the COVID-19 Pandemic. *Society and Culture in South Asia*, 7(1), 148–154. <https://doi.org/10.1177/2393861720977632>
- Renzetti, C. and D. Curran, (1992). "Sex-Role Socialization", in *Feminist Philosophies*, J. Kourany, J. Sterba, and R. Tong (eds.), New Jersey: Prentice Hall.
- Shifman, L. (2012). An anatomy of a YouTube meme. *New Media & Society*, 14(2), 187–203. <https://doi.org/10.1177/1461444811412160>

¹ Masequesmay, G. (2020, May 28). Sexism. In *Encyclopedia Britannica*. Retrieved from <https://www.britannica.com/topic/sexism>

² <https://www.pewresearch.org/fact-tank/2015/08/28/men-catch-up-with-women-on-overall-social-media-use/>

³ Barbara Plester, Take it like a man!': Performing hegemonic masculinity through organizational humour

⁴ https://static.nytimes.com/email-content/INT_4981.html

⁵ Vandana Mohandas, <https://www.thenewsminute.com/article/misogyny-time-coronavirus-lockdown-can-sexist-jokes-stop-now-121316>

⁶ The language of the meme itself creates a context that justifies the expression of prejudice against women and facilitates the tolerance of sexism.

⁷ <https://www.india.com/entertainment/trending-bollywood-news-rishi-kapoor-gets-trolled-by-netizens-for-sharing-sexist-joke-during-coronavirus-lockdown-3980538/>

⁸ https://data2x.org/wp-content/uploads/2021/03/UCSD-Brief-3_BigDataGenderCOVID19SouthAsianMisogyny.pdf

⁹ Though in the South Asia, 'shyness' is associated with femininity. In this article, we are reinterpreting the term to associate it with masculinity.

¹⁰ <https://www.theatlantic.com/international/archive/2020/03/feminism-womens-rights-coronavirus-covid19/608302/>

¹¹ <https://www.newstatesman.com/2017/11/social-media-and-silencing-effect-why-misogyny-online-human-rights-issue>

¹² <https://www.kcl.ac.uk/news/harmless-sexist-jokes-are-as-insidious-in-ai-as-in-real-life>

A Critical Discussion on Policy Practice on Gender-based Violence in Bangladesh

Sayema Khatun *

Abstract: Despite the spectacular success of Bangladesh in closing the gender gap in statistical representation, the ground level real scenario of women's life is inflicted with never-ending numerous extreme forms of violence. I have made an effort to inquire of this paradox through anthropology. Reviewing the policy on gender-based violence and questioned the existing tendency in the practice of the Government, non-government entities engaging with the concept of culture I attempted to understand what perpetuates and regenerate violence in numerous forms and sought an answer beyond legal framework and existing policy measures.

Discussing the Policy Brief on Gender-based Violence

Last year I attended a policy brief on gender-based violence (GBV) presented at the General Economics Division, Planning Commission of Bangladesh funded by UNFPA (2019) clearly showing gender-based violence data contrasting with the policy implication expected in spite of having fairly an impressive list of law reforms, policy measures, support services and budget allocation.¹ The study reports from Government bodies like BDHS 2014, VAW Report 2015, BMMS 2016, SVRS 2018, and MoWCA report 2019 and transnational agencies as UN Bodies (Imtiaz: 2019). The GBV data presented by BBS, BMP and other organizations indicates the policy implication expected was quite opposite to the real situation we live. The apparent failure of all these policy measures and programs adopted to prevent, diminish and eliminate GBV, ensure security for women and achieve gender parity is perplexing. Participating academicians (including myself), bureaucrats, non-government organizations (NGOs), policy practitioners and activists sought the answer to why the desired outcome of policy could not be achieved in spite of series of policy reforms.²

* Associate Professor, Department of Anthropology, Jahangirnagar University, Savar, Dhaka 1342
Email: sayemakhatun@yahoo.com

¹ A list of enacted law and legal provisions to prevent GBV by the GOB is as follows:

Women and Children Repression Prevention Act, 2000, Dowry Prohibition Act, 1980, Acid Control Act, 2002, Acid Crime Prevention Act, 2002, Domestic Violence (Prevention and Protection) Act, 2010, Prevention and Suppression of Human Trafficking Act, 2012, Pornography Control Act, 2012, Hindu Marriage Registration Act, 2012, Deoxyribonucleic Acid (DNA) Act, 2014, Child Marriage Restraint Act, 2017 and Child Day Care Centre Act, 2018 (draft). Special provisions have been incorporated in the National Women Development Policy 2011 and National Children Policy 2011 to prevent violence against women and children and to ensure supports for the victims. The High Court Division of the Supreme Court of Bangladesh has given a set of directives on 14 May 2009 for action in cases of sexual harassment of women in all academic institutions, workplaces. Steps are being taken to implement the directives of the Court. The section 509 of the Penal Code has been included in the schedule of Mobile Court Act, 2009 to take immediate action against the perpetrators of sexual harassment. All extra judicial punishments including Fatwas are now banned as illegal as the declaration of the High Court Division (Imtiaz: 2019), end of two-finger test and rape law reform (2020).

² Policy brief on Gender-based violence, Project, Strengthening Capacity of the General Economics Division (GED) to Integrate Population and Development Issues into Plans and Policies Project, Funded by UNFPA, Bangladesh, General Economics Division, Planning Commission, UNFPA on 21 November 2019.

Gender-based violence (GBV) is a systemic and organized crime that takes place within a support system favoring violence against women inbuilt in our patriarchal structure of the society includes but not limited to marital and domestic violence, sexual harassment and abuse, rape, sex trafficking, institutional abuse. In spite of constitutional guarantee of gender-equity³, adoption of international human rights protocols as Convention of the Elimination of All Forms of Discrimination against Women (CEADAW, 1986), and National Women Policy (2008, revised in 2011), strong legal provision, thoughtfully devised progressive policy, the affirmative action program, and victim support service offered by the Government, the rise, intensity, extent and atrocious nature of gender-based violence (GBV) in Bangladesh right at this moment is gravely disturbing. With this concern, I am attempting to move toward a solution through anthropology of policy, relatively new domain of anthropology in the context of Bangladesh, which inquires, how do policies 'work' as instruments of governance, and why do they sometimes fail to function as intended (Shore & Wright: 1997).

I would like to begin my inquiry on the policy preventing gender-based violence with the questions put forward by British anthropologists Cris Shore and Susan Wright back in 1997: How do policies construct their subjects as objects of power, and what new kinds of subjectivity or identity are being created in the modern world? How are major shifts in discourse made authoritative and how it is devised in policy-making process to get desired outcome? Funded by and engaging with the transnational non-state agencies and non-government organizations (NGO) (UN Women, UNFPA, UNDP for example), the government of Bangladesh (GOB) is currently pushed forward for legal and public policy framework dealing the crisis of violence against women (VAW)⁴ adopting human rights approach bringing "home"/"private" world into the public judicial system and also intervening harmful traditional values, beliefs and practices that tolerate or allow violence to happen:

"Laws and policies can provide the foundation for a coordinated and comprehensive approach to violence against women (VAW). While a historic number of laws and policies against violence are now in place, implementation is still lagging behind. Measures to strengthen effective implementation should include training of officials who handle cases of violence against women, the establishment of mechanisms for monitoring and impact evaluation as well as accountability and better coordination. Committing adequate human and financial resources is also essential".

- UN Women: 2020

This clearly demands for and laid out an action plan for intervention of state in citizen's home and family what is assumed to be "private" and thus independent of state's business. As a signatory of CEADAW, GOB is mandated to bring its laws and policies

³ The constitutional provisions in articles 19 (3), 28(1), 28(2), 28 (3), 29(1), 29(2) and 65(I) guarantee equal rights of women with men in state and all walks of public life. Ensuring equal opportunity and human dignity for all citizens irrespective of gender founded upon democratic principles become the responsibility of the state apparatus. The Constitution has also ingrained the principle of affirmative action in the article 65(2) as in South Africa, Namibia, Uganda, Argentina, and Tanzania, for fifty reserved seat for women representation in the parliament (Ali, Md. Osman: 2016).

⁴ GBV and VAW are almost interchangeably used in policy documents.

into alignment with international human rights standards and protocols. The right-based agencies believe that laws and policies, accompanied by complementary strategies, awareness programs, can play a positive role for long-term impact in social and cultural behavior. It can be expected that, the existence of laws and policies may hold the message of no tolerance to VAW and women's right to live a life free of violence (ibid: 2020). Government of Bangladesh is also mandated to follow the sustainable development goals (SDGs) designed by UN. In order to achieve SDG 5 for gender equality⁵, structural local and global obstacles have to be eliminated.

The year 2019 ended with the good news of being a topmost gender equal country in South Asia closing the World Economic Forum's Global Gender Gap Index, 2018 by closing 48% of its overall gender gap with economic, education, health and political indicators and achieving milestones. Jumping 25 notches last year, Bangladesh has retained the second position among the most gender equal countries in Asia on World Economic Forum gender gap index this year (December 18, 2019). This is not only a self-celebratory occasion, but also appreciated by the UN bodies, INGOs.⁶

| SOUTH ASIA | | |
|------------|--------------|---------------|
| Country | Overall rank | Overall score |
| Bangladesh | 48 | 0.721 |
| Sri Lanka | 100 | 0.676 |
| Nepal | 105 | 0.671 |
| India | 108 | 0.665 |
| Maldives | 113 | 0.662 |
| Bhutan | 122 | 0.638 |
| Pakistan | 148 | 0.550 |

Source: <https://bdnews24.com/economy/2018/12/18/bangladesh-retains-second-place-in-asia-on-world-economic-forum-gender-gap-index>

Nevertheless, the lived reality of the women regarding violence against women (VAW) or gender-based violence (GBV) paradoxically contradicts with this narratives of great achievement showed in statistical presentation. This contradiction provokes me for carrying out further investigation.

⁵ SGD 5: gender parity: Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation. Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws.

⁶ As an example, in the section of gender equality and women's empowerment of country profile of USAID mentioned "Bangladesh has made remarkable progress in the last 20 years in improving the lives of women and girls. Maternal mortality rates are falling, fertility rate is declining, and there is greater gender parity in school enrolment. At the same time, 82 percent of married women suffer gender-based violence and pervasive sexual violence prevents women from achieving their full potential" (USAID: 2020).

Arguing on Limitation of Policy Practice

Policy has been considered as strong and effective weapon for combating GBV and laid out as the strategic plan for protection of women and having been placed as a safeguard for women safety and security.⁷ However, the policy world is dominated by hegemonic male presence in bureaucratic space and often keeps women's voice unheard and experience marginalized. I shall begin my investigation beginning with critiquing the policy practitioners' perspective basically built on spectacular violence as an event, its statistical presentation, emergency response measures and mobilizing legal apparatus leaving out dynamics of power and politics. In order to do so, I invoke feminist social thought on gender-based violence questioning the very nature of the nation-state as modern, secular, rational and nevertheless, masculine, and its relation to women as citizen that shapes policy formulation.

As I mentioned earlier, transnational agencies are actively influencing and pushing for the adoption of advanced normative frameworks on ending violence against women and girls partnering with the Government of Bangladesh (GoB) and women's advocates for their implementation through the adoption, strengthening and implementation of national laws, policies and strategies (UN Women: 2020). Ministry of Women and Children affairs (MoWCA) has also put out a comprehensive national review report for implementing Beijing Declaration 1995 (2019). Passing and implementing effective laws and policy has been regarded as milestones toward achieving gender parity making "personal" as "political", especially gender-based violence has long been considered in the realm of "personal"/"private" and henceforth, not to be considered as political agenda (UN Women: 2020) and not worthy of state intervention. It took many years of activism to put forth GBV into the agenda of political program and thus in the legal system and public policy framework. Agency of state and political organizations has been considered as the intervention to the "private space"/ "home"/"family" considered as independent of the realm of public/state/politics/Legal system, whereas transnational organizations like UN bodies and NGOs envision laws and policies as foundation of a coordinated and comprehensive approach against violence against women (VAW). While they express satisfaction in achieving progressive laws and policies put into place, finds drawback only in implementation of legal framework basically blaming socio-cultural practices and in my view, falling into the pitfall of top-down approach.

⁷ "When brought into alignment with international human rights standards, such as those contained in the convention on the Elimination of all Forms of Discrimination against Women (CEDAW), Laws and policies can often play a positive role in changing attitudes and behaviors in the long term, especially when they are accompanied by complementary strategies such as awareness-raising on ending violence. Once laws are in place, they convey a strong message that violence against women is not tolerated and that it is the right of every woman to live free of violence." (UN Women, 2020) leaving

I identify the limitations of this policy making process yet persist as:

1. Heavily relies on numbers and statistics and lack of qualitative analysis for budget and time-framed projects
2. Focuses on post-rape, post-violence measures, instead of preventive measures
3. Dominated by legal approach
4. Based on victim-perpetrator relation ignoring complex agency in male-female relation and nuance understanding of femininity and masculinity
5. Focus on violence, ignores peace-building frameworks and sustenance of harmony.
6. Finally, silent on compromised democratic practice and restoration of democratic institutions and value. Politics and power relation in policy process, pervasive corruption, culture of impunity has not been taken into account.

In this context, I would like to proceed with my arguments as following:

A. That policy is both as political technology for governance and cultural agent (Shore & Wright: 1997) need to be recognized situating in the power-relation at the field.

B. Apparently neutral statistical and numerical GBV data limits our ability to view the complex nature of GBV, if not historically and culturally contextualized and not presenting with supporting narratives bearing the nuance of the quality of women's life.

C. Vernacularizing policy and rethinking beyond law is required to make real change.

Before diving into my arguments on the limitation on GBV policy practice, we need to have a brief survey of the current situation as presented below.

Spectrum and Magnitude of GBV/VAW in Numbers

Some examples of frequent news headlines found in national dailies in Bangladesh from a year span are as follows: "Rape victims doubled in 2019: ASK" (The Daily Star: 31 December 2019), "Gazipur woman blackmailed, raped for 13 years" (Dhaka Tribute: 23 October 2020), a child bride (13) died 34 days after marriage, 23 Rape attempts had been made, 16 of those had been against children, 5 had been sexually assaulted including 3 children reports Bangla Tribune (Nov 3, 2020).

Bangladesh Mahila Parishad (BMP) reports that, during October 2020 alone 436 women and girls had been tortured of which 216 were raped, 44 gang raped of which 101 are children and 25 children were gang raped. BMP reported, the number of events of violence against women were 3,918 last year, but in the halfway of this year it came alarmingly to 2,083. 217 women were assaulted in September, highest in any single month since 2010 (October 2019). The alarming numbers of rape has become as high as 5,000 in last 10 months, as reported human rights activist Sultana Kamal (Nov 2019). BMP estimated that 731 women and children were raped in the first six months of 2019. In comparison to 2018, 942 in total similar cases were recorded in the whole year. 'Voice of Female Worker' reported of 26,752 dead bodies of women workers have arrived in Bangladesh from abroad in last 10 years facing sheer mental, physical torture and sexual abuse (Nov. 2019).

Nusrat Jahan, 18, had been murdered in April 2019, setting fire pouring kerosene on her in the roof of a madrasa in Feni who refused to withdraw her complaint of attempted rape against the principal of the institution. Sparking of public outrage and mass protest brought Prime Minister Sheikh Hasina into take vow to bring the killers into justice. Principle with his 15 associates had been sentenced to death in October 2019. Ayesha Khanam, director of Bangladesh Mahila Parishad said, "This verdict has set an example. It shows that with utmost sincerity we can ensure justice within our existing system." Government instructed 27,000 educational institutions to form committees to prevent sexual assaults after this incident.

In first six months of last year, the number of children sexual abuse and rape has doubled up and reached the number for the whole year of 2018, reports the international rural women day celebration national committee (October 2019). In their finding, 75% of the children have been abused by the close relative, neighbors and acquaintances are the perpetrators at home, school, on the way to school and their familiar settings. Tamanna Rahman, member of the committee provided a statistics collecting reporting in national dailies of 572 children have been sexually abused including 75 boys in this six months in the country and 23 children have been killed after that. Rape and sexual abuse of young boys in Madrasa and other places are relatively a new revelation for us while the media is hesitant to call it rape, using an alternative Bengali word *balatkar*. While I was working on this article, an 8-year-old class three student in Faridpur died after rape in his madrasa at the end of this year (December 25, 2019). Sexual abuse and rape of boys has yet to include in our conceptual framework in legal and policy measures. The abused children are mostly come from lower class and are silenced for honor of the family.

National girlchild advocacy forum research released that, (Islam, Udisa, Bangla Tribune: December 18, 2019), about 60% adolescent girls experience sexual harassment in the public space having causal relation with child marriage. They surveyed 392 female of 12-35 of age. 59.45% women experienced sexual harassment at the age 11-17 at public space that includes physical contacts. Dhaka Metropolitan Police is receiving 10-12 online harassment complaints every day, 90% of them are pre-teen and teenage girls (Nazmul Islam, Deputy Commissioner of DMP).

It is obvious that, the actual events of GBV are way too high than those had been reported. Many more cases go unreported for fear of being blamed, stigmatized, ostracized or disowned by the family. Jinat Ara Haque, Executive director of a women organization WE CAN said in the policy dialogue at planning ministry (21 Nov 2019) that, only 3% of the real incidents got reported.

Understanding Gender-based Violence to Intervene Policy

I would like to draw the conceptual framework and methodological tools from my discipline to deal with this pervasive crisis. I would situate my discussion within a tradition of mobilizing anthropological theory and method wherein we "use the knowledge, skills, and perspective of their discipline to help solve human problems and facilitate change" (Chambers: 1985, 8). The problem identified by the community, gender-based violence in this case, has been placed at the center of the analysis. Anthropological works with the question of how people are affected by gender-based violence and the ways that the local and global structures impact those experience has

been expanding and anthropologists squarely recognize gender-based violence as socio-political problem to be intervened with transformative device. Anthropology begins with recognizing the diverse array of culture for which solutions also need to be contextual and diverse. Using its central tenets, holistic and comparative approach toward culture, anthropology offers ethnographic intimacy of the issue.

Through ethnographic intimacy, "putting people first", participating, living, working directly with the affected people, entering into the world, consciously place their experience at the forefront of our knowledge base by actively participating in the resolution of a social problem, anthropologists enable the policy world to envision the crux of the matter. While observing individual experience of violence, their methods and tools allow us to view the incidents as the manifestation of structures and institutions (interpenetrating class, gender race, ethnicity, religion and caste) that potentially create and maintain violence while finding the points to intervene.

Beginning from American Anthropologists Michelle Zimbalist Rosaldo and Louise Lamphere's ground-breaking book *Woman, Culture and Society* (1974), anthropology of gender-based violence has taken its shape by a number of works, as Peggy Reeves Sandy's work on socio-cultural aspects of rape in 1982 and later in 1992 the edited volume *Sanctions and Sanctuary: Cultural Perspectives on the beating of Wives*, for example. A rich spectrum of work probed many directions, among which, the relationship of gender-based violence with the state has been critically examined. In *Human Rights & Gender Violence, Translating International Law into Local Justice* Sally Engle Merry (2006) examined the local cultural practices and stressed to translate and vernacularize international law into local context. Plesset's rich ethnographic analysis situated in a domestic violence shelter (2006), presents how the institutions play as an intermediate agents between state and domestic society. Alcalde examines women's experience with domestic violence in the context of Peru (2010) and how it actually intersects with the structure of inequality and violence imposed by the state itself. McClusky demonstrated the power of participant observation-based research to bring the voices of the women suffered violence out and heard. Jennifer R. Wies and Hillary J. Haldane's compilation of *Anthropology at the Front Lines of Gender-based Violence* (2011) scrutinized the roles played by the frontline workers in global effort in battling gender-based violence. Parson's ethnography of social suffering in Chile (2013) challenged the mechanisms through which state reproduces the matrix allow gender-based violence to happen and reproduce. For this article, I am especially indebted to their more recent collection of ethnographies from around the world *Applying Anthropology to Gender-based Violence, Global Responses, Local Practice* (Wies & Haldane, 2015) for making my argument in the context of Bangladesh. This is a project to directly link anthropological theory and methods to applied and practical solutions for addressing gender-based violence in myriad forms. I endorse the assertion of Ainoon Naher, as she goes, "GBV against women occurs in the context of men's social power and position, and as a result of structural violence, which entails processes, policies, and politics that systemically produce and reproduce social and economic inequities that determine who will be at risk for assaults and who will be shielded from them." (Naher: 2018).

Following Wies and Haldane, while situating cases of abuse and building conversation around it in a local context, role of history, structure and power can be exposed at the

same vein, viewing the case as really real, happening within asymmetrical power relationship (i.e., *byata chele/meyechele*, *bhodrolok/chotolok*, husband/wife, *pahari/bangali*, garments worker/manager, domestic help/master, employer/employee), fixed by structures, historically produced and consciously engaged that allow a person or group to inflict violence against another. We can apply the core method of anthropology, participant observation, doing anthropology at the frontline of gender-based violence context and use the power of "imponderabilia of everyday life" (Malinowski: 1922) attending the economic, social, civil, legal, spiritual, educational and kin-based systems of people's lives at the ground without divorcing the act of violence from the other structures in one's life without reducing them merely victim/perpetrators of violence producing heterogenous account of violence considering the standpoint of their interlocuters (*ibid*: 2015).

This is particularly useful to understand the limitation of universal human rights frameworks as well and find the alternatives, practical approaches for improving the delivery of services to the victims and action-oriented foundation for transdisciplinary collaboration. Recognition and articulation of a theoretical shift is needed in conceptualizing gender-based violence, exploring the new avenues of multi-disciplinary framework and mixed methods from the disciplines like psychology, criminology, legal studies, and sociology to influence, shape, and change gender-based violence intervention systems and policy domains. In this transdisciplinary conversation and collaborations, anthropology is richly equipped to offer a greater awareness of cultural differences through documenting the local lived experiences into policy discourse getting it out of the box of graphs, tables and numerical presentation.

Playing out of the gendered script of the nation-state through the engagement of state and non-state actors has been drawn into attention by the anthropologists for last half century to grasp gender-based violence. When an activist feminist anthropologist, such as Sabur, seeks to hold state responsible after the criminal offence as gang rape committed, restoring justice for the violated women through legal apparatus is clearly the major concern, precisely that means putting the rapists into the quick trial and ensure punishment (Sabur, Seuty: October 7, 2020). Furthering her concern, I would like to push deeper into the context to unpack the rape-culture in which such spectacular violence as gang rape can take place that never be understood as the discourse of crime and punishment only. Nevertheless, state never acts as a gender-neutral entity, rather, imagination of hegemonic masculinity and subjugated femininity has been inbuilt in the very formation of nation-state.

The statistical data shows that the perpetrators are in the most cases are not the strangers and even the intimate ones (Gavey 2005, Gelles & Straus 1988, Price 2002). The violence caused by the intimate one takes place at home. The recent researches on domestic violence and the women's testimonies shows us that home is often the place of masculine dominion where men demands women's unpaid labor and service often translate into wife-beating, child-abuse, female domestic servant abuse and can be a place of terror for women and children. Women are often blamed for not to be able to maintain the ideals of home. Women also internalized her role and blame themselves for failing to make the ideal home. Home, designating as autonomous private space, the domestic violence cannot be intervened by the state agencies, needs expanded discussion.

Analysis of predominating feature of the perpetrators/offenders brings the people connecting with power and influence such as local gangs, police, political leaders, school-college-madrasa teachers, transport workers, student and youth member of ruling party which links to impunity. It has become very difficult to file cases or take the perpetrators to court when connected with the power-nexus. Scholars, activists, and law professionals (Hamida Hossain, Ain o Salish Kendro, Sheerin Huq, Naripokkho, for example) points to the normalization of violence and culture of fear and impunity for escalating unchecked rape incidents. The problematic role of police station, law enforcement agency, medical-legal practitioners with connection of the influential offenders create an evil nexus that has become extremely difficult to challenge.

Limitation of Statistical Data presentation and Judicial Measures

Statistics only can count the manifestation of violence a when reported, leaving the everyday life women move through threat of violence and possibility of being domestically and sexually abused, raped, violated and harmed in numerous forms and extents. GBV often is very intimate and personal in nature hurting at the core of women's dignity and honor as human being. The intervention programs tend to depend on the statistical and numerical presentation for measuring, planning, and especially for budget allocation. Quantifying the quality of women's life blocks us to grasp the complexity and depth of the problem, indicators used to understand quality of women's condition are insufficient. Neither presenting isolated, abstract and decontextualized data removing analyzing overarching critique of culture nor providing a cross-sectional view of ground can sufficiently (Adelman 2004, 49) attack the problem. Women development approach mostly focus on the economic side as we see in the calculation of cost of gender-based violence to convince development partners to invest and allocate budget. While the economic calculation allows us to measure the consequence of GBV tangibly, it cannot help us to grasp the intangible aspect of GBV and its grave consequence on human life.

It took decades of struggle to define sexual abuse and rape as punishable offence under law. The feminist legal activists have called for the reformation of the very definition of rape as forced penetration where consent for sexual act has become the central consideration. Some feminists, as Brownmiller, (1975) argued rape as simply an expression of general male aggression and violence against women, and others have argued for more specific cause and effect in legal system authorizing male violence against women (Das 2005, Smart 1995). The way legal system functioning in the courtroom situation unfold the idea of good and bad women interpenetrating the category of class, ethnicity, religion and caste having serious impact on the legal decisions on rape. A rape trial, thus, has become the stage for the gendered script of the nation-state has been played out where women are implicitly treated as the property of men whose property- rights have been violated through rape, not as the offence against women. Rape Law Reform Coalition has been initiated programs to reform legal framework for prevention of rape in all its spectrums including marital rape⁸. In spite of enormous

⁸ "Most such women are unable to seek redress due to the continued prevalence of gender discriminatory laws -- in particular section 375 of the Bangladesh Penal Code 1860 -- that create an exception to the definition of rape, in cases of marriage, where the wife is aged below 13," The Coalition also calls for immediate repeal of the exception to section 375 of the Bangladesh Penal Code which clearly deprives

significance of effective and powerful law reform, we need to be aware that, judicial procedure can only redress the aftermath of violence, such as rape. Preventing rape in real life and everyday fear of rape in everywoman's mind cannot be addressed if we focus on preventive measures that can contribute eliminating the pre-conditions of rape exist structurally in the society placing our full attention to the very norms and culture that underpin ideologies reproduce and perpetuate rape culture in which consciously or unconsciously, we all participate.

The national conference on rape law reform last year organized by BLAST, has been came up with the specific challenges in existing legal framework to deal with rape cases and set a milestone toward achieving justice for rape survivors. They have elaborately discussed the obstacle to access legal system to punish the criminal by the victim and explained elaborately why rape survivors remain out of court, out of court settlement. Among the important issues includes, two finger test, DNA test, abolition of witness law section 155 (4), under the Evidence Act 1872, defining marital Rape, camera trial, redefining the existing definition of rape, financial constrain and Settlement outside court, power nexus of the police and perpetrator. Making rape in part of masculinity and passive victimhood as femininity hold the root cause of rape culture that must be contested in all its manifestation and unfolding. Women's representation only as victim is problematic in designing intervention program.

Rethinking Beyond Law

As a practicing anthropologist, my attention goes beyond legal framework. I focus on the patriarchal misogynist culture from which sexual violence arises and perpetuates. With few exceptions, the mainstream body of modern Bangla literature and media representation which dominate and manufacture consent, create meaning of human life, shape consciousness have been created by the dominant Bengali male elite that create, and perpetuate women subordination normalize gender-based violence, blame and shame the victim. Compounding problem of societal norm and expectation, where a rape victim is often viewed as a person without honor and stigmatized by the community. The reason of the high number of rape cases that stay out of the court and either try to mitigate through settlement or just keep silence is the culture of shaming and blaming the victim, instead of the perpetrators.

How agency and subjectivity of women can be at the heart of intervention program? Mapping structural vulnerability, policy and educational intervention redefines the many treatments toward women which had been culturally acceptable and establish as punishable criminal offense. Contradictions of rights-in-practice is huge. Human rights discourse offers a powerful opening for women and families when combined with increased access to state-based forms of justice though, this empowering potential is limited by social and economic vulnerability and discrepancies between rights-based subjectivities and pre-existing understandings of self (W & H:179). Women often adopt micro-strategies of resistance to negotiate their positioning with the household and to temporarily escape violence, and mostly remain unable to truly challenge their treatment

married women of their fundamental rights to protection from sexual violence," reads the release (The Daily Star: November 6, 2020).

and uproot their subordinate position. To make women's rights interventions fully effective, it needs to be accompanied by structural changes. As sexual intimacy generates complex emotions, a definition of domestic violence that includes everything from beating to harsh words spoken can lead to a decline in the possibility of intimacy itself. These scholars suggest a community-based pedagogical model of intervention in many cases rather than a punitive model of controlling violence (Das: 2013).

The inbuilt misogynic culture and mind-set have never get disappeared through the policy adopted from outside. Often, this developmental approach has been considered as “western” and thus outside of our culture. Ideal of gender parity often associate with western value of human rights and appear to be conflicting to our own culture and religious practice. Integrating vernacular rhetoric and concept of equality, instead of imitating and implanting western notions, has seldom explored. Without making gender parity vernacular and homegrown, sustainable policy outcome cannot be achieved.

Acknowledgement

I especially thank Mr. Ahsan to invite me as a discussant at the policy brief at the Project, Strengthening Capacity of the General Economics Division (GED) to Integrate Population and Development Issues into Plans and Policies Project, Funded by UNFPA, Bangladesh, General Economics Division, Planning Commission, UNFPA, 21 November 2019. I am indebted to Dr. Shamsul Alam, Member (Senior Secretary), General Economics Division (GED), Planning Commission, honorable chief Mr. Md. Mafidul Islam, General Economics Division (GED), Planning Commission, honorable joint chief, General Economics Division, Planning Commission, Mr. Khandker Ahsan Hossain, my learned colleague Keynote speaker Professor Sayed Saikh Imtiaz, my colleague and fellow discussant Ms. Jinat Ara Executive Coordinator, We Can, and all the distinguished delegates and participants from related Ministries/ Divisions/ Directorate/Agencies/ NGOs. I also thank Bangladesh Labor Foundation, Ain o Salish Kendro and Kormojibi Nari for their invitation as the keynote speaker on Sexual harassment, and rape and providing me the data and resources.

Reference

- Chambers, Erve. 1985. *Applied Anthropology: A Practical Guide*. Englewood Cliffs, NJ: Prentice-Hall, Inc
- Ali, Md. Osman (October 1, 2016) *Constitution and Gender Rights*, in The Independent, Dhaka, <http://www.theindependentbd.com/printversion/details/62146> , accessed November 16, 2020
- Brownmiller, Susan (1984) *Against our will, Men, Women and Rape*- Fawcett Books, New York
- Choudhury, D., Forum on Women in Security and International Affairs (Bangladesh), & Bangladesh Freedom Foundation. (2005). *Sexual harassment of Bangladeshi women at workplace*. Dhaka: Forum on Women in Security and International Affairs.
- Choudhury, D., Forum on Women in Security and International Affairs (Bangladesh), & Bangladesh Freedom Foundation. (2005). *Sexual harassment of Bangladeshi women at workplace*. Dhaka: Forum on Women in Security and International Affairs.
- Das, V. (2013). Violence, Crisis, and the Everyday. *International Journal of Middle East Studies*, 45(4), 798-800. Retrieved October 26, 2020, from <http://www.jstor.org/stable/43304015>

- Dhaka Tribune Desk Report (November 3, 2020) Bangladesh saw 216 Rapes in October, retrieved from https://www.dhakatribune.com/bangladesh/2020/11/03/bangladesh-saw-216-rapes-in-october?fbclid=IwAR2ytVXGWqMKCrFaUMKpGRUTcjm9gaJtl_wyuNxjHOYeFto34Na2Vlc2npo, accessed on Nov 5, 2020
- Feminist Dictionary (1980), New York
- <https://bangladesh.unfpa.org/en/news/enhancing-monitoring-and-reporting-gender-equity-based-global-practices>
- https://www.banglatribune.com/others/news/599383/বয়ঃসন্ধিকালে-যৌন-হয়রানি-শিকার-৬০-শতাংশ-বাড়ছে?fbclid=IwAR3eWKbYHHAcWO5TnFi2CIMA1txRXoFMU-ey5mxAYmC_Y7kM2PdMy6zeiVk
- <https://www.blast.org.bd/content/publications/BLAST-RLR-Conference-Report.pdf>
- <https://www.deshrupantor.com/capital/2019/10/14/173992>
- https://www.deshrupantor.com/capital/2019/11/25/182902?fbclid=IwAR1nXecMedJHxrNNgdYfz-gF-YfuHqKZI_cQQRmQUU9L4-IHzlJONanx8j8
- https://www.deshrupantor.com/capital/2019/11/25/182902?fbclid=IwAR1nXecMedJHxrNNgdYfz-gF-YfuHqKZI_cQQRmQUU9L4-IHzlJONanx8j8
- <https://www.dhakatribune.com/bangladesh/2019/07/01/shishu-adhikar-forum-child-rape-incidents-rise-sharply>
- <https://www.dw.com/en/bangladesh-shocked-by-rise-in-sex-crimes-child-rape/a-49539423>
- https://www.ittefaq.com.bd/wholecountry/116772/ফরিদপুরে-বলাৎকারের-শিকার-মাদ্রাসা-ছাত্রের-মৃত্যু?fbclid=IwAR3sJRFdvvskWFmk-V4fCwhsX2r03-alEpYMRxw-Jq-LWudfKTY6PO_4D04
- <https://www.reuters.com/article/us-bangladesh-harassment/bangladesh-sentences-16-to-death-for-killing-teenager-in-harassment-case-idUSKBN1X30MQ>
- <https://www.reuters.com/article/us-bangladesh-harassment/bangladesh-sentences-16-to-death-for-killing-teenager-in-harassment-case-idUSKBN1X30MQ>
- <https://www.thedailystar.net/country/731-women-raped-in-bangladesh-in-6-months-1768477>
- Huda, Taqbir (July 26, 2017) Why is marital rape still legal in Bangladesh? Dhaka: The Daily Star, <https://www.thedailystar.net/opinion/society/why-marital-rape-still-legal-bangladesh-1438600>, accessed on Nov 2, 2020
- Human Rights Watch (July 3, 3030) Submission to the UN special rapporteur on violence against women, its causes and consequences regarding Covid-19 and the increase of domestic violence against women retrieved from <https://www.hrw.org/news/2020/07/03/submission-un-special-rapporteur-violence-against-women-its-causes-and-consequences>, accessed on Nov 3, 2020
- Jeremy Posadas. (2017). Teaching the Cause of Rape Culture: Toxic Masculinity. *Journal of Feminist Studies in Religion*, 33(1), 177-179. doi:10.2979/jfemistudreli.33.1.23
- LEWIN, E., & SILVERSTEIN, L. (Eds.). (2016). *Mapping Feminist Anthropology in the Twenty-First Century*. New Brunswick, New Jersey; London: Rutgers University Press. Retrieved November 9, 2020, from <http://www.jstor.org/stable/j.ctt1c99btf>
- Merry, S. E. (2006). *Human rights and gender violence: translating international law into local justice*. University of Chicago Press.
- MoWCA (JULY 22, 2019) Comprehensive National Review Report, for Beijing + 25 Implementation of the Beijing Declaration and Platform for Action 1995, Bangladesh, accessed on 14 November 2020, pp. 45-51, https://mowca.portal.gov.bd/sites/default/files/files/mowca.portal.gov.bd/page/99b35321_5385_4e92_95f5_c3f10096c151/Beijing%2B25%20Report-FINAL_22-07-2019.pdf

- Naher, Ainoon, (January 12, 2018) *The Current Status of Gender-Based Violence at the Workplace in Bangladesh, with Focus on the RMG sector*. FNV Mondiaal, Bangladesh, FNV.
- Naher, Ainoon, *The Current Status of Gender-Based Violence at the Workplace in Bangladesh, with Focus on the RMG sector*. (January 12, 2018). FNV Mondiaal, Bangladesh, FNV.
- Rosaldo, Michelle Zimbalist and Lamphere, Louise (1974) *Woman, Culture and Society*, Stanford: Stanford University Press
- Sabur, Seuty (2020) Rape, Scopophilia and our collective rage, Dhaka: The Daily Star, retrieved from <https://www.thedailystar.net/opinion/news/rape-scopophilia-and-our-collective-rage-1973633>, accessed on 3 Nov. 2020
- Saikh, Imtiaz (December 23, 2019), Policy Brief, paper presented in the discussion on Policy Brief on Gender based Violence: A challenge for reaching SDGs, Project, Strengthening Capacity of the General Economics Division (GED) to Integrate Population and Development Issues into Plans and Policies Project, Funded by UNFPA, Bangladesh (Unpublished).
- Shore, C., Wright, Susan, & European Association of Social Anthropologists. (1997). *Anthropology of policy : critical perspectives on governance and power*. Routledge.
- Siddiqi, D. M. (2003). The sexual harassment of industrial workers: strategies for intervention in the workplace and beyond. *CPD-UNFPA publication series no, 26, 40*.
- Star Online Report (Oct 26, 2020) 63% men agree beating their wives is justified if denied sex: Study, Dhaka: The Daily Star, <https://www.thedailystar.net/country/news/63-men-agree-beating-their-wives-justified-if-denied-sex-study-1986329>, accessed on 1 Nov. 2020
- UN National Assembly (2014) Report of the Special Rapporteur on Violence against Women, its Causes and Consequences, Rashida Manjoo (A/HRC/26/38) Retrieved from <https://www.unwomen.org/en/docs/2014/5/special-rapporteur-on-violence-against-women-a-hrc-26-38>, accessed on Nov 4, 2020
- UN Women (2020) *Passing and Implementing Strong Laws and Policies*, <https://www.unwomen.org/en/what-we-do/ending-violence-against-women/passing-strong-laws-and-policies>, accessed on 26 Oct 2020
- USAID (March 16, 2020) Gender Equality and Women's empowerment, <https://www.usaid.gov/bangladesh/gender-equality-and-womens-empowerment>, accessed 26 October, 2020
- Wies, Jennifer R, & Haldane, Hillary J. (2015). *Applying anthropology to gender-based violence*. Lanham, Boulder, New York, London: Lexington Books.
- সায়োমা খাতুন (২০১৫) মুক্তিযুদ্ধের *His-Story*, ইজ্জত ও লজ্জা, পাবলিক নৃবিজ্ঞান, রেহনুমা আহমেদ (সম্পাদনা) দৃক, ঢাকা
- সায়োমা খাতুন (২০১৮) # মি টু বাংলাদেশ ২০১৮ এবং ফিরে দেখা জাহাঙ্গীরনগরের ধর্ষণবিরোধী আন্দোলন ১৯৯৮, রোকেয়া কবির (সম্পাদনা) নারী ও প্রগতি, বর্ষ ১৪ সংখ্যা ২৮, নারী প্রগতি সংঘ, ঢাকা

Gendered Communication and Women's Vulnerability in Digital Media of Bangladesh

Md. Sayeed Al-Zaman*

Abstract: Men in traditional patriarchic societies leverage women to facilitate their own lives, whereas women, being silenced, do whatever their “masters” want. Women are inferior to men in power and possession who are also the controller of social institutions. These conditions govern their communication pattern. Digital media brought both men and women into its virtual platform. Women in Bangladesh, a poverty-stricken Muslim country, misunderstood cyberspace as a modern instrument of their “emancipation” from the vicious patriarchic system. However, this article argues why and how their hopes turn into despair while men are unleashing structured violence and strengthening dominance using digital media. In this regard, recent incidents of virtual harassment have been observed to understand the true color of men's authority on women. It has been seen that women's increasing optimism and progressiveness are positively related to the men's domination over communication in cyberspace to sustain and/or bolster their social position.

Keywords: Gender communication; digital media; violence against women; Bangladesh; patriarchy.

Introduction

A truly democratic state is to protect its citizens' rights and treat them equally. European Union in its promulgation of Fundamental Rights presents five decisive factors: dignity, freedoms, equality, solidarity, and justice to ensure the proper rights to the citizens (Charter of Fundamental Rights, 2012). The constitution of the People's Republic of Bangladesh addresses a plethora of promises under the section entitled Fundamental Rights in the constitution, such as freedom of speech, human rights, equality before the law, equality of opportunity, etc. (A. Khan, 2014). Although democratic countries pledge to treat their citizens equally and justly, discrimination, suppression, and persecution still exist there. Even in Europe, the voice in favor of separation is rising to date (Henley et al., 2017). On the other hand, Bangladesh has recently secured its position as the most notorious country in persecuting its religious and ethnic minorities (Hasnat, 2017). Therefore, words of human rights are wonderful to ponder between the pages of books, whereas the reality is opposite to some extent.

In Bangladesh, a poverty-stricken Muslim country, diverse co-cultures were promised of social equality along with nationalism, secularism, and democracy after its inception (Haq, 2015). However, “social equality” only remains in the constitution, and co-cultures are enduring agony nowadays. Bangladesh (previous Bengal) society is proudly addressed as the harboring ground of solidarity and “culture of a thousand years”, yet not so much effort has so far been given in investigating the true nature of cultural attitudes and practices, and the interplay among social communities. The Indian sub-continent is the victim of patriarchy from the very early era of civilization in this region. From the Vedic age, women have been living as “subhuman” (Narayanan, 2016). Even Bangladesh has recently ranked 134 in terms of gender inequality in the world (UNDP, 2018) where

* Lecturer, Dept. of Journalism and Media Studies, Jahangirnagar University, Savar, Dhaka, Bangladesh, Email: msalzaman@juniv.edu

women are still being terrified incessantly, and the propensity is swelling. In Bangladesh, from the beginning of this century, remarkable prioritize has been being given to women to elevate their condition and alleviate their prior backwardness, although the outcomes of these are not always convincing and palpable. To picture women's development and empowerment in Bangladesh, few instances are repeatedly shown: two Prime Ministers are women; 50 seats among 300 seats in Jatiya Sangsad are reserved for women; many women are becoming candidates in various elections; the celebration of the International Mother's Day, International Women's Day, etc.; incorporating women in diverse local and national activities; increased reproductive healthcare and conditions of rural women, etc. (Abdin, 2008; Chaity, 2018; "Women elected", 2018).

However, these developments are also questionable as a few selected self-empowered figures do not necessarily represent the conditions of all women. Besides, the reserved seats for women in Jatiya Sangsad, as some opine, is just a "token representation" (Zyma, 2018b). Women empowerment those are shown with greater importance not always paint the actual life that women lead. Rather, most women are still living a primitive life in traditional Bangladesh society wherein patriarchy triumphs with vigor. Because of their social power and status, women are still the utmost victim of gender violence widely. Even crimes against women, such as rape, murder, stalking, humiliation, dowry, etc. are somewhat increasing in contemporary time due to a range of factors, including the absence of justice, and social equality. Women are largely being victims of violence and discrimination even within their own families (Chowdhury, 2014; Odhikar, 2018; UN Women, 2018). Development in Bangladesh is somewhat paradoxical that lets women be more vulnerable since they step out of home and come into contact with the outside world, which is brutally patriarchal; thus, the prevalence of violence outside of the home increases (Khan, 2005).

The contemporary digital revolution is leading the Bangladesh society toward a more complex zone of social chemistry. Traditional society (the present condition of Bangladesh society is likely to be "quasi-traditional" or "would-be-modern") rocked by modern industrial digital products and services is on the brink of utmost transformation. Although it has previously been hypothesized that digital media in the absence of face-to-face (F2F) communication would free women from physical and social restraints, and provide equality and freedom of expression (Morahan-Martin, 2000), a unique method of gender discrimination has been germinated.

Women and Digital Media: A Techno-feminist Perspective

HollaBackNYC, a photoblog and web platform of women activists, was founded in 2005 adopting a slogan "If you can't slap him, snap him" to raise awareness to combat street harassment (Daniels, 2009). In the contemporary networked world, women's online activism against gender inequalities and mistreatments commence a unique feminist movement known as "cyberfeminism", a neologism coined by Plant (2000), demonstrates feminists' works on theorizing and exploiting new media and internet technology. As a conceptual product of Third Wave feminism, this movement either denies or reformulates the previous notion that technological development is socially and culturally constructed which supports and promotes masculine culture. However, Haraway (1987) as the foremost champion of cyberfeminism agrees on women's need to be more proficient in

technology use and engage in “informatics of domination” along with tech-savviness and political awareness.

The concept of “global sisterhood”, although having ethnocentric and dogmatic connotations according to some, is about to turn into a reality with the help of an online network (Zaytoun & Ezekiel, 2016). Furthermore, after few striking incidents, including the Delhi Gang Rape in 2012 and Jimmy Savile's allegations, the Fourth Wave of feminism emerged based on chiefly digital media to bolster the women's network worldwide against misogyny (Cochrane, 2013). Riding this movement, digital media-based feminist campaigns, such as #YesAllWomen, #MeToo, etc. have rocked, and are still rocking the world. However, women's participation in the digital public sphere and the exploitation of new-age communication technology as a boulevard of their social emancipation throughout the world varies in a great deal. Unlike the developed countries, women from traditional societies have little opportunity to convene in cyberspace due to their socio-economic conditions and intense patriarchic bondage. Even the degree of scopes varies within the social classes of women.

Women from Bangladesh urban affluent society, for an example, have higher social status, education, skill, willingness, and access to manifold communication technologies, whereas those from rural area are less interested in entertainment and modern benefits due to their lower social status, less economic solvency, illiteracy, and prime focus in serving family rather than engaging in communication or networking. On the other hand, women from the middle-class socio-economic background are the moderate users of digital media platforms. Due to greater sociocultural openness, urban affluent women embrace new technology and practices than the women from other socioeconomic and sociocultural backgrounds. These women tend to use social networking sites, essential websites, and contemporary digital technologies more frequently. Their modern and would-be modern lifestyles and cultural practices are reflected in their virtual identities. Middle-class women, in practice, have a more complex psyche as they must make a balance between their social image and personal demand, they, therefore, are perceived as relatively more strategic and, to some extent, rigid while partaking in the digital public sphere. Which commonality all women of Bangladesh share, irrespective of their classes, is that men tend to control them even in cyberspace through acute gendered communication.

Gendered Communication: How Women Interact in Digital Media

Gender differences impact communication patterns, thereby both men and women interact differently in real-life contexts according to sociocultural prescription. Apart from biological orientation, women's interactions are designed and guided by the socialization process. Most often, such development is faulty and biased toward men. Following their birth, both male and female enter two distinct subcultures within a broader culture which later produce them as “masculine” and “feminine” respectively assigning different social roles, rules, and regulations (a few exceptions of a female having masculine features and a male having feminine features are avoided here). Those social variations force them to perform distinctively even in verbal and non-verbal communication (Nelson & Brown, 2012). On this ground, “women tend to engage in rapport talk or relationship-oriented talk”, whereas “men tend to engage in report talk or

task-oriented talk”. Thus, men are motivated to status-seeking efforts while women are motivated to intimacy-seeking efforts (Columbaro, 1992; Eunson, 2013; Tannen, 1990). The Bangladesh sociocultural environment is simultaneously traditional, patriarchal, and Islam by nature. Such condition let women to be a suitable subject of patriarchal domination.

Patriarchy shapes not only the psyche of women but also dictates what they should and should not do and/or say, moreover, the language women use and deconstructs women’s demands and hopes, dreams, and realities as well (Mannan, 2011). This legacy continues even in digital media. Women, for instance, barely use slang in the digital public sphere, whereas men use it as usual. Although women’s participation in cyberspace was for salvation and freedom, and cyberspace has also been intended to be democratic and secured, the barriers of interaction remain the same since men have appeared as the supervisor of communication there (Rukhsana, 2018). When men are the gatekeepers of communication, women’s involvement is de-escalated. As Kramarae argues:

The language of a particular culture does not serve all its speakers equally, for not all speakers contribute in an equal fashion to its formulation. Women (and members of other subordinate groups) are not as free or as able as men are to say what they wish to, when and where they wish, because the words and norms for their use have been formulated by the dominant group, men. (Kramarae, 1981:01)

Fearing denial and exclusion, like other co-cultures, women, even qualified ones, usually abstain themselves from engaging in critical discourses in cyberspace, rather involve in phatic communication, the type of communication that “supplies a minimum information but a maximum of supportive chat” through which they maintain and (re)build social relations (Žegarac, 1998). Their attitude in the digital space is often self-censored. Since women in traditional Bengali culture are expected to be docile and susceptible in character so that they can easily be subjugated, they too act upon the unseen patriarchic manuscript *per se*.

Patterns and modalities of gender communication in digital media depend on the contents used. Three different forms of “divergent” contents are seen in digital space: (a) verbal dialogue of conversation is converted into non-verbal written text; (b) movements (and speeches too) in physical settings are converted into recorded documents (i.e. video, audio); and (c) face-to-face communication is converted into (digitally) mediated communication. Therefore, digital media has emerged as a time and space neutral communicative platform.

In another sense, digital media is a hypermedia since it provides scopes to its users to create and manipulate profuse information and contents, and disseminate them to a relatively larger audience within a shorter time than the traditional media. Every medium has its specialties, so do digital media. Narration and engagement in cyberspace highly differ from mainstream media (Manovich et al., 2001). From this aspect, women’s engagement with men, their use of language, and narrative patterns have been observed along with how they are being affected by the online predators in digital media. The pattern of gendered communication in digital media is, to some extent, perceived as one-sided, dominant, arbitrary, tyrannical, and meticulous. Women’s treatment of men there is usually power-driven, although several other stimulants play key roles, such as ideology, the intention of oppression, social position, and prior social learning. In a systematic way, men tend to accomplish three goals through gendered communication:

(a) to become more superior to women; (b) to exploit women; and (c) to preserve their status quo. To do so, they accommodate and modify their behavior and communication patterns while interacting with women in the digital sphere.

The collective approach allows men to mobilize and act as a community to retrograde women's psyche through several methods: misbehaving, denying the legitimacy and importance, devaluing and humiliating, and organize and reshape public conception against the women's validity in society. The collective force of domination gets powerful when women as an opposition try to avail autonomy and privileges breaching men's domination. Those inimical behaviors of men cause dreadful consequences to women: fear of exclusion, self-derogation, and even suicidal tendencies. On the other hand, the individual approach of gendered communication investigates more micro-level interaction between men and women and found some disturbing phenomena. In one-to-one relationships, sexual harassment through digital content, both verbal and non-verbal is rampant. Men in such interpersonal interaction generally harass women based on three specific grounds: (a) relationship issues; (b) desire, and (c) rejection, which means these factors instigate men to become involved in an interpersonal assault. These types of maltreatments include several serious and heinous acts, such as fake profile creation, publicize private information, nudity, and obscenity, revenge porn, threatening, vulgar message, and unwanted nuisance, etc. These actions of men are mainly motivated by anger, revenge, provocation, and the sex which causes women's mental breakdown, depression, body shaming, poor self-esteem, and most notably the suicidal tendency. This strategic persecution targets individual woman, scandalize and molest her virtually, and exemplify her to terrify other women to obey "men" as their master. In Bangladesh, incidents of cyberbullying are skyrocketing, and the vulnerability of women as well. As we see, on either side, women are the looser and endure agony as well as mistreatment (Preetha, 2015).

Cyberbullying and Vulnerability of Women

A few dominant incidents are still haunting the discourse of cyberbullying in Bangladesh. Purnima Shil, a gang-raped survivor of northern Bangladesh during the post-election period 2001 while she was just 13 years old, has repeatedly been tormented by the stigma of rape, and socially treated as "impure". Her ordeal is yet to end as few culprits shamed her by creating a pornographic Facebook page using her name, photographs, and other necessary details. She is incessantly being beaten, threatened, molested, and inhibited in her educational institutions, workspaces, and even in public ("How a Bangladeshi Rape Survivor Was Shamed on Facebook," 2016).

Arif, a man from Shariatpur of Bangladesh, secretly filmed a woman taking a shower, and later forced her to intercourse with him threatening to release the footage on the internet. Thus, he raped her like the other five women he did earlier and spread the recorded rape video in online. The victim subsequently was in fear of losing her conjugal life, and the video compelled her to leave her house making a "refugee" (K. N. Islam, 2017). A victim of revenge porn told that she left her village, and has been living in a relative's house from the day her "secret" video was released on social media. Afterward, she used to wear a veil to save her from further abuse by society and discontinued her study. She has been suffering from psychological issues, including severe anxiety and

stress, depression, flashbacks the abusive memories, distrust, lower self-esteem, alienation, and oftentimes suicidal thoughts. Victims of doctored photos and objectionable text with private photos are also numerous (Malik, 2017).

Cybercrime includes the actions “targeted against women with a motive to intentionally harm the victim, using modern telecommunication networks” (Halder & Jaishankar, 2012:18). Of all subdivisions of cybercrime, cyberbullying is the most discussed and appalling one. In Bangladesh, a technologically developing country, women are the worst victim of cyberbullying than the men. In 2017 alone, the Cyber Help Desk of the Bangladesh government’s ICT division received more than 17,000 complaints (Akteer, 2018). Around 73% of women as internet users face manifold cybercrimes; of them, only 23% lodge complaints. A recent study conducted by the Cyber Crime Awareness Foundation (CCABD) found 73.71% of the victims belong to the age group 18 to 30 years. Besides, 30% of total victims do not know how to seek help after affected by cybercrimes (“73% women”, 2017; “Women aged”, 2018). Needless to say that men are the perpetrators in committing these offenses.

Although several attempts have already been made for fighting these heinous attacks of cyber-privacy, including *Cyber Attorokkha* or Cyber Self-defense by Female Empowerment Movement (FEM), Digital Sister Project in collaboration with BRAC, the anti-pornography act, etc., the number of cases are superseding the fruits due to the lack of proper punitive measures (Ahasan, 2017; Digital Sister, 2018). CCABD (2018) identifies four categories of decisive cyberviolence that are usually being committed against women in Bangladesh by their men counterparts. The most threatening of them is denigration that is creating a fake profile, spread rumors, and vile contents, and 27.95% women are the victim of this type of bullying. Due to identity liquidity in cyberspace, anyone can be anyone, and identity theft poses a serious problem. To distort social images of the targeted women, perpetrators collect information, create fake online profiles, and generate and thereafter disseminate vile contents. Some offenders, most of them are known to the victims, often produce and spread rumors about them.

Publishing doctored photos and videos and other information without consent to harass women is another popular technique of victimization, which cause 23.53% women to become bullied. Publicize embarrassing private and identifying information have 22.45% of total sufferers. Besides, online threats and verbal abuse, mostly through “masquerading”, and sending obscene contents, despite having 19.11% sufferers, according to the study, are becoming more widespread nowadays. However, A gargantuan number of incidents are still being remained unreported, concealed, and beyond recognition. Three reports here are to certify the statement: (a) 25% victims do not report as the law would not support them; (b) 23% do not report fearing to be harassed again, and (c) 17% do not report worrying if it tarnishes their social image. This is the missing link of why the number of cases is relatively lower when the violence against women seems very high (CCABD, 2018). Two underlying patriarchal mechanisms encourage women to remain mute and not to speak out against violence.

Firstly, the social base of a woman in Bangladesh society is too fragile compared to a man. A man’s profile in this traditional and prejudiced society is measured by his income, working capacity, strength, and often body structure, while a female’s identity is mostly “image” based: She must have to be benign, sophisticated, beautiful, obedient, naïve,

religious and servile, and getting out of this patriarchal boundary is considered as audacity which would make her "spoiled". In such circumstances, she always needs to be concerned about her appearance, voice, and attitude in public. Others' treatment to her become more important which eventually lower her self-esteem. Thereby, fearing if no one would believe them, they abstain from reporting the incidents. Thus, capitalizing social stigma, perpetrators again release cyber assault on women (TED.com, 2015).

Secondly, victim-blaming is the most notorious attitude that women as victims get from their men counterparts after being bullied in both cyberspace and real space. It could either be another deliberate strategy and/or inadvertent outcome from men to prevent women from complaining when it comes to sexual harassment and other forms of violence. When women express their harassment and seek protection, or when the vulnerability of women by men as perpetrators are exposed in public, the other men of cybersociety frequently, as it has randomly been seen, either try to protect the image of their peer or feel threatened with their own identity. Thereafter, they take it easy to blame the victims by using some specific pejorative terms: *behaya* (shameless), *magi* (prostitute), *nosta* (spoiled), *oshalin/oshlil* (indecent), *dushchoritra* (characterless), etc. those are used only to define a "bad" woman's characteristics.

Two psychological expositions provide a hindsight of victim-blaming. Firstly, when the men see women suffering from violence and oppression, but unable to prevent them, they began to derogate the women for their misfortune. The more they suffer, the greater they scorns is, even though the victim is innocent (Lerner & Simmons, 1966). People's perception is based on ethical propositions: good people receive good things, whereas bad people receive bad. But victimhood of an innocent person violates this perception, and therefore, to accommodate prior belief, men often deny the innocence of women sufferers as a defense shield. Secondly, men refute women's misfortune caused by bullying (especially sexual), rather victim-blaming is positively related to men's past sexual aggression toward women (Gray et al., 1993). In Bangladesh cyberspace, three interrelated unique propensities among men have been observed: (a) most of the men have seemingly a common goal that is to subdue women's voice; (b) thereby, men often feel sympathetic to other men who are accused of harassing women; (c) this feeling, to some extent, arouse a sense of belongingness and proximity among themselves.

Men oftentimes address beautiful women with gorgeous body shapes as *maal* ("goods" for consumption) in Bengali which is nothing but the objectification of women's bodies. Therefore, men's reaction and treatment of women in Bangladesh digital public sphere would better be understood from their dialogues and behaviors. The three most common but significant expressions of men are detailed here as examples. First, men tend to mitigate the crime of rape, revenge porn, or other sexual assaults on women (e.g. revenge porn of Porimol, rape, and assault in Rajbari and Shariatpur) through victim-blaming: "women who go out at night should be raped", "...if she (woman) would be decent (*pordashil*) and maintain Islamic virtues, she would not be raped", "due to rape, women are still a little bit decent nowadays". According to them, women instigate men's inner concealed lust by revealing their bodies. Therefore, they should be "more Islamic, cultural, and conservative" to evade sexual assaults.

Second, a remarkable number of men in cyberspace have been found unaware and even disgustful against marital rape that prevents them from being dictatorial during

copulation with their partners. On the question of women's sexual rights, including partner choice and punishment of marital rape, scornful statements come out from these men, such as "wife is for sex whenever the husband wishes to, and marriage legalizes this, so then, what is marital rape!" Exemplifying sexual right a Western ideological product, they (mis)interpret it as the right to "free sex" that is prohibited in Islam. They also define it *haram* as *jenah* (having premarital copulation) for Muslims, according to religious scriptures, is an unforgivable sin.

Third, men, as it seems, often perceive women's activism online (e.g. Women's Chapter) and participation in social movements (e.g. Shahbag Movement in 2013) as awkward and irreligious. Thereby, they rebuke them so fervently with a variety of hate speeches: "we will fuck you; we will rape you; we will teach you a lesson", "women can be both mother and whore, but you (the activist women) people are the second one". According to their opinion, what women know is little compared to men, so they should remain silent on salient issues and let the men handle those. Women are delicate and vulnerable who deserve to remain inside the house and not partake in "men's job".

To men, "out-of-boundary" women are subject to be disgraced, and also society repudiates such "outlawed" women because of their "deviant behavior". Such hypermasculine expressions and legitimizations are everywhere in Bangladesh digital media. In some cases, vulgar and abusive language seem to be the weapon of men to expel women from discourses. Such an adverse environment of domination also prevents women from being outspoken against men's assault and bullying.

Reasons for Women's Vulnerability

Narada XIII states: "A woman is unfit to enjoy independence. The father protects her during infancy, the husband protects her when she is grown up, and the sons protect her in her old age." (Spellman, 1964: 46). Such a traditional view of women's life is still performing in Bangladesh society. Although owing to the widespread consciousness and movements across the globe, women got participatory rights in politics along with other necessary human rights, women from underdeveloped countries like Bangladesh are hitherto struggling to achieve their proper legitimacy and equity in society. Unfortunately, the miseries and deprivations of Bangladesh women start from their own family and society play the role of second exploiter.

Social phenomena determine how communication patterns differ between men and women from the aspect of gender. (Millett, 2016) suggests eight instruments that shape and prepare the ground of patriarchy which eventually let men have the opportunity to rule over communication: (i) ideological; (ii) biological; (iii) sociological; (iv) class; (v) economic and educational; (vi) force; (vii) anthropological (myth and religion); and (viii) psychological. However, the root causes of social deprivation those direct the communication pattern between men and women in Bangladesh are more subtle, and, to some extent, unlike what Millett postulates.

Economic disparity

To manifest disparities among social groups, three basic forces function: (a) unequal rights over wealth; (b) subsistent ideological hegemony within society; and (c) social institutions (Riaz, 2014). The foremost condition behind the suppression of women is

their economic backwardness and limited rights over wealth. Although the female labor force participation rate (LFPR) is increasing in Bangladesh after the 1990s, recent data support the gradual inclination in the female unemployment rate. Furthermore, the wage gap between male and female workers for the same work and the same hour, particularly in informal employments, is widening since women get paid almost half of their men counterparts (R. I. R. Islam, 2013; Shibli, 2018; World Bank, 2018). Interesting but true, behind this discriminatory attitude, “capitalistic interest” lies. When a certain group of people in a society is introduced as “subhuman”, they would become easy to hire and less payable in the workforce. Thus, wide discrimination in almost all spheres of women's life in Bangladesh also makes them “cheap labor” (Sharp et al., 1997).

Since most of the women's jobs are still unrecognized and confined into their household chores which have no immediate and explicit economic value and contribution, they are ultimately denied from the economic system (Riaz, 2014). As women's activities have no or little economic significance and/or certification, they become subject to massive and organized social exploitations: fewer human rights and social benefits, limited entertainment, etc. Although the scenario has been changing from the last three decades since women are joining in the working force and contributing to the national economy, men are still controlling the financial sectors and distribution of wealth. Even in most cases, women have no meaningful control over their income. Thus, earning women too is trapped in a man-made economic system.

Women's presence in digital media in pursuing deliverance, to some extent, seems unsolicited to men due to their failure (or fear) of treating women as their equivalent. Such condition allows men, who are economically superior to women, to contemplate that women should not avail the same service, space, and entertainment using new-age technology as men do. Cyberviolence against women, therefore, could be a systematic denial of women's presence and freedom online.

Social power and authority

Power is the production of the intended effects, often over others (Russell, 1996). Economic power lets men to be the supreme authority of the society. Bangladesh's traditional patriarchic society, therefore, gives them enough power to do whatever they like that further reinforce patriarchic strength. In the same way, a man from his boyhood perceives as well as enjoy more rights and better opportunities than a girl which bolsters his sense of superiority and dominance. Familial contribution in making a “strong man” and “good girl” is incontrovertible. Society thereafter, through cultural miseducation like “boys will be boys”, take it like a man, and so on, officialize the discrimination. As male and female both are nourished and trained differently and discriminately, separate roles and rules are attributed upon them. Hitherto the collective idea in Bangladesh society puts muscle power over the knowledge, skill, and quality of a person that sanction women as weak and vulnerable. Due to physically inferior, patriarchy claims, women are unable to do what men are capable of. Rather, they are valued by their outer beauty. *Melamesha* (social contact) of grown-up girls with other boys is seen as unethical in rural areas, and urban middle-class society as well. To prevent so, girls are kept under strict surveillance of the family as well as society as they could something illegal and “spoil” the holiness of the society. The paradox is: prestige and reputation of the family and society depend on women while they are the most deprived groups. Gender socialization thus translates

women into a marginalized group in Bangladesh traditional society (Stockard, 2006), and continuation of exploitation paves the way of women's increased sufferings inside and outside of digital media.

Ideological hegemony

What society teaches women to become “good girls” by not being deviant, and no women should go beyond the unseen line illustrated by patriarchy. To confirm the desired outcome, men in society customize a series of equipment, setting, and decorating what we can call “ideology”. Bangladesh women are highly saturated by male-dominated ideology for decades so that they as a community, women have almost lost their capacity of thinking, rather act according to the vested system. Average women of Bangladesh, beyond individual quality and performance, seem more concerned with their and their peers' appearance, beauty, shape, and how men treat them (Zyma, 2018a). Even perceiving the benefit of adjoining with men, women are also often motivated and ready to eject their feminine conditions. In this process, women internalize patriarchy and become the champion of men's ideology and superiority, and validates their actions (Adler, 1927). Thus, a woman-vs-woman situation is often observed in discourses on Bangladesh digital media.

To exploit women more perfectly and effectively, manipulated religious ideals along with other sociocultural ideologies are used by patriarchy. “Child's heaven is under mother's feet”, a well-recognized colloquial expression, for instance, has been modified into “wife's heaven is under husband's feet” to make women more submissive to his husband as “master”. Besides, subtly, men verify and represent themselves as more pious and defender of religion (Islam in this context) than women who are addressed as the reason for spoiling the essence of scriptures by being “deviant” and “sinner”. As a psychological response, to prove their religious and obedient image in front of society, women often vest themselves more into Islamic practices. However, in this case, Islam act as a political weapon of men to exploit and subordinate women (Mannan, 2011) which also decrees a woman should be *half* of a man whoever the persons are (Azad, 2004).

Islam as a religion is one of the most suitable oppressive tools for men to exploit women in Bangladesh. Men referring to Islam dictates how women should behave and live their lives. Their clothing is also set and often widely criticized by men. Even men take the chance to justify rape and other sexual violence against women through victim-blaming as we have seen in the previous section. Forced attribution of *hijab* and *burqa* (Islamic veil) either from early childhood or grown-up age and acceptance of *Sharia* law in the public domain is accelerating in Bangladesh society as a part of Islamic revitalization and modernization. Digital public sphere as an open and effective discursive zone, Islamists of Bangladesh favoring the newly produced religiocultural notion, relentlessly try to establish the value of “Islamic culture” as a part of greater identity politics (Hussain, 2010).

“Face” politics

Bangladesh in 2000-09 was sickened by the chronic incidents of acid throwing. 99% of the perpetrators were identified as men who left 1392 women affected which is almost twice of affected men, although in the world's perspective, the majority (67%) of the total victims are men. The reasons behind these attacks are rejection in love, dowry, and

refusing a marriage proposal (“Everything”, 2017; “Statistics”, 2010). Perpetrators’ intention is quite simple: to deface the victims, as women in society are most valued by their facial beauty. This propensity over the years has reduced remarkably. However, the same expression of hatred and unfulfillment has been rejuvenated by and seen in digital media. Face in a broader sense not only specify the outer look or a certain body part, rather an individual’s social image or identity.

Cyberspace unlocked many possible modus manners to taint women’s “face” in front of society, such as revenge porn, rumor spreading, masquerading, public humiliation, etc. Even women in social media often abstain from expressing their mind, fearing they could be humiliated and underestimated by men. These women either tend to avoid partaking in discourses or become naïve in critical issues and rather maintain relations using the social spaces. They are ideologically forced indeed not to be open, and often women themselves conceive such unseen restriction as worthy.

Deceasing name is the foremost attack on one’s identity what Afghan women are still enduring and, to a certain degree, fighting for (Joya, 2017). The situation of Bangladesh women is better than this, yet extremely vulnerable in terms of their social, political, and economic identity. They have no socially established and exclusive identity at all, although a handful of women are “quasi-equal” to men. Women’s identity is shaped by men as they are the authority of social institutions and ideological spheres.

The discrimination both in real space and cyberspace is based on women’s politicized identity. As a socially deprived group, women’s identity in Bangladesh is determined by gender, economic capacity, existing Islamic belief amid society, biological features, and superstitions. Patriarchy tends to bestow women almost no equal and shared ground considering them as “worthless” or “incapable” because of their stereotyped gender and biological identity. Thus, men inaugurate a masculine hegemony over the women around them.

Social (mal) treatment

Society itself is biased toward men since patriarchy captures and controls the social institutions: family, economics, religion, education, state, and language. Therefore, men’s expressions of masculinity can be seen in every sphere of this male-dominated society. *Salish*, *Panchayat*, and other local judiciary are still active in many villages and suburban areas of Bangladesh those tend to provide men almost immunity and women severe punishment for the same crime. Such social malpractices are reinforced from social prejudices, religious myths, and toxic masculinity. Toxic masculinity focuses on stereotypical gender roles. Gender stereotyping certified by the prejudiced society encourages men to see women through a gender-biased lens. To them, men must be aggressive, unemotional, worldly, ambitious, objective, strong, dominant, competitive, self-confident, logical, independent, and should like math and science and act as leaders. Whereas women are gentle, tactful, religious, talkative, neat, dependent, and they cry easily, do not use harsh language, are interested in their appearances, aware others’ feelings, and need for security (Taylor, Peplau, & Sears, 1999). These gender stereotypes are the products of anti-women and anti-feminine perception that let men (think to) be more possessive and dominating over women in cyberspace which is also evident in their expressions.

Such stereotypical ideation “perpetuates a collective social fantasy that men are active subjects positioned against women”, whereas women are passive and vulnerable because of men’s “natural” sexual conquest and violence (Bealer, 2011). Moreover, the primitive concept of manhood, gender hierarchy, an “alpha male” is facilitating and validating men’s aggression within the traditional society (Douglass, 2017). Such manifestation of cruelty and unjust of men to women is nothing but for attaining a superiority feeling (Adler, 1927). The features of toxic masculinity follow the men in the digital media and stir them up to engage in negative cyber-attitude, expose to depression, and externalize this depression with anger and aggression more likely to women that they have been incessantly experiencing in contemporary times (Parent et al., 2018). These conditions prevent women from being men’s equivalent either in digital media or outside world.

Conclusion

Communication between men and women indeed complex by nature since a range of factors, including culture, class, religion, gender, economy, politics, and so on contribute to shaping the communication pattern. The truth is offline and online, neither space favor women in Bangladesh. On the contrary, men harvest both spheres to sustain their dominance over women. And to do so, they repeatedly terrify women through cyberviolence that is not necessarily physical rather psychological. The outcome is dreadful. Around the country, the cyberbullying causes an average of 11 suicide attempts of female victims each year from 2010 to 2014 which was 8 until 2008 (Akter, 2018), which means the men are becoming too repressive that is making the women more vulnerable. Why such pitiful incidents are soaring is an inevitable outcome of the absence of proper justice, lack of social concern and motivation, insufficient awareness campaigns, illiteracy and miseducation, poverty, etc. (Halder, 2017).

Hitherto, studies on gendered communication are insignificant in the context of a developing country like Bangladesh where the society is still traditional in nature but social development is speeding up due to the thriving economy. As an inevitable consequence, the cultural lag appears, the existing social norms, values, and beliefs become incompatible with and somewhat contradictory to the technological advancement and modernity. In Bangladesh, owing to the continuing social progress, women are gaining more knowledge and modern outlook, particularly from cyberspace, and steadily escaping the imprisonment of patriarchy. This paradigm shift of their prior social condition has also enhanced their performance in communication with men. In counter of that, patriarchic domination is accumulating more power to tame women fearing women would take over with their increased power. In such a state, gendered communication in Bangladesh cybersociety is getting more complicated, so it is worthy to delve into. Certainly, the coexistence of men and women would be beneficial for the country’s healthy development. Digital media, in this regard, either could be a decisive bridge between both groups or would be ended up as a failure eventually.

References

- 73% women face cyber crimes: Tarana. (2017, March 8). Retrieved January 19, 2019, from The Daily Star website: <https://www.thedailystar.net/country/73-women-face-cyber-crimes-tarana-1372849>
- Abdin, M. J. (2008). *Women Empowerment in Bangladesh* (SSRN Scholarly Paper No. ID 1031612). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=1031612>
- Adler, A. (1927). Individual psychology. *The Journal of Abnormal and Social Psychology*, 22(2), 116–122. <https://doi.org/10.1037/h0072190>
- Ahasan, N. (2017, November 12). Cyber Attorokkha: How education and training have changed the online experience for Bangladeshi women. Retrieved January 19, 2019, from The Daily Star website: <https://www.thedailystar.net/women-action/cyber-attorokkha-how-education-and-training-have-changed-the-online-experience>
- Akter, F. (2018, June 17). Cyber violence against women: The case of Bangladesh. Retrieved January 21, 2019, from Gender IT website: <https://www.genderit.org/articles/cyber-violence-against-women-case-bangladesh>
- Azad, H. (2004). *Women* (3rd ed.). Dhaka, Bangladesh: Agamee Prakashani.
- Bealer, T. L. (2011). Of Monsters and Men: Toxic Masculinity and the Twenty-First Century Vampire in the Twilight Saga. In G. L. Anatol (Ed.), *Bringing Light to Twilight: Perspectives on a Pop Culture Phenomenon* (pp. 139–152). New York: Palgrave Macmillan US. https://doi.org/10.1057/9780230119246_11
- CCABD. (2018, May 20). *Cyber Crime Trend in Bangladesh*. Cyber Crime Awareness Foundation. Retrieved from https://ccabd.org/research_cyber_crime_in_bangladesh/
- Chaity, A. J. (2018, July 11). Women empowerment: Bangladesh sets example for the world. Retrieved January 17, 2019, from Dhaka Tribune website: <https://www.dhakatribune.com/opinion/special/2018/07/12/women-empowerment-bangladesh-sets-example-for-the-world>
- Charter of Fundamental Rights of the European Union. (2012). *Official Journal of the European Union C326*. 391–407.
- Chowdhury, M. F. I. (2014, August 5). Revisiting position of women in Bangladesh. Retrieved January 17, 2019, from The Daily Star website: <https://www.thedailystar.net/revisiting-position-of-women-in-bangladesh-35755>
- Cochrane, K. (2013, December 10). The fourth wave of feminism: Meet the rebel women. *The Guardian*. Retrieved from <https://www.theguardian.com/world/2013/dec/10/fourth-wave-feminism-rebel-women>
- Columbaro, N. L. (1992). You just don't understand: Women and men in conversation, by Deborah Tannen. (1990). *Human Resource Development Quarterly*, 3(4), 398–401. <https://doi.org/10.1002/hrdq.3920030412>
- Daniels, J. (2009). Rethinking Cyberfeminism(s): Race, Gender, and Embodiment. *Women's Studies Quarterly*, 37(1/2), 101–124. JSTOR. Retrieved from JSTOR.
- Digital Sister. (2018). *Report Cybercrime in Bangladesh*. Dhaka, Bangladesh. Retrieved from https://www.youtube.com/watch?v=WDDQ-Z7_N3k
- Douglass, R. (2017, August 4). More Men Should Learn The Difference Between Masculinity and Toxic Masculinity. Retrieved January 21, 2019, from Huffington Post website: https://www.huffpost.com/entry/the-difference-between-masculinity-and-toxic-masculinity_b_59842e3ce4b0f2c7d93f54ce

- Eunson, B. (2013). *Communicating in the 21st Century* (3rd ed.). New Jersey: John Wiley & Sons.
- Everything you know about acid attacks is wrong. (2017, November 17). Retrieved March 20, 2019, from BBC Three website: <https://www.bbc.co.uk/bbcthree/article/5d38c003-c54a-4513-a369-f9eae0d52f91>
- Gray, N. B., Palileo, G. J., & Johnson, G. D. (1993). Explaining rape victim blame: A test of attribution theory. *Sociological Spectrum*, 13(4), 377–392. <https://doi.org/10.1080/02732173.1993.9982040>
- Halder, D. (2017). *Revenge Porn against Women and the Applicability of Therapeutic Jurisprudence: A Comparative Analysis of Regulations in India, Pakistan, and Bangladesh* (SSRN Scholarly Paper No. ID 3160444). Rochester, NY: Social Science Research Network. Retrieved from Social Science Research Network website: <https://papers.ssrn.com/abstract=3160444>
- Halder, D., & Jaishankar, K. (2012). *Cyber Crime and the Victimization of Women: Laws, Rights and Regulations*. Information Science Reference.
- Haq, E. (2015, March 9). Fundamental Principles of State Policy. Retrieved January 16, 2019, from Banglapedia: National Encyclopedia of Bangladesh website: http://en.banglapedia.org/index.php?title=Fundamental_Principles_of_State_Policy
- Haraway, D. (1987). A manifesto for Cyborgs: Science, technology, and socialist feminism in the 1980s. *Australian Feminist Studies*, 2(4), 1–42. <https://doi.org/10.1080/08164649.1987.9961538>
- Hasnat, M. A. (2017, December 28). 'Religious and ethnic minorities are most persecuted in Bangladesh.' Retrieved January 16, 2019, from Dhaka Tribune website: <https://www.dhakatribune.com/bangladesh/law-rights/2017/12/28/religious-ethnic-minorities-persecuted-bangladesh/>
- Henley, J., Sheehy, F., Swann, G., & Fenn, C. (2017, October 27). Beyond Catalonia: Pro-independence movements in Europe. *The Guardian*. Retrieved from <https://www.theguardian.com/world/ng-interactive/2017/oct/27/beyond-catalonia-pro-independence-movements-in-europe-map>
- How a Bangladeshi rape survivor was shamed on Facebook. (2016, October 27). *BBC News*. Retrieved from <https://www.bbc.com/news/av/magazine-37683929/how-a-bangladeshi-rape-survivor-was-shamed-on-facebook>
- Hussain, N. A. (2010). Religion and modernity: Gender and identity politics in Bangladesh. *Women's Studies International Forum*, 33(4), 325–333. <https://doi.org/10.1016/j.wsif.2010.02.006>
- Islam, K. N. (2017, November 11). Police looking for ex-BCL leader who raped women and released video clips online. *Dhaka Tribune*. Retrieved from <https://www.dhakatribune.com/bangladesh/nation/2017/11/11/police-leader-raped-women-released-video>
- Islam, R. I. R. (2013). *Female labour force participation in Bangladesh: Trends, drivers and barriers* [Working paper]. Retrieved from http://www.ilo.org/newdelhi/whatwedo/publications/WCMS_250112/lang--en/index.htm
- Joya, B. (2017, July 27). Where is my name? Afghan women fight for their own identity. *Reuters*. Retrieved from <https://www.reuters.com/article/us-afghanistan-women-name-idUSKBN1AC3F7>
- Khan, A. (2014). *The Constitution of Bangladesh with Short History and Relevant Explanation* (2nd ed.). Dhaka, Bangladesh: Bengal Law Books.
- Khan, F. C. (2005). Gender violence and development discourse in Bangladesh. *International Social Science Journal*, 57(184), 219–230. <https://doi.org/10.1111/j.1468-2451.2005.546.x>

- Kramarae, C. (1981). *Women and Men Speaking: Frameworks for Analysis*. Rowley, MA: Newbury House Publishers.
- Lerner, M. J., & Simmons, C. H. (1966). Observer's reaction to the "innocent victim": Compassion or rejection? *Journal of Personality and Social Psychology*, 4(2), 203–210. <https://doi.org/10.1037/h0023562>
- Malik, S. (2017, December 26). The spectre of online sexual harassment. *The Daily Star*. Retrieved from <https://www.thedailystar.net/opinion/society/the-spectre-online-sexual-harassment-1510252>
- Mannan, P. Md. A. (2011). *Grameen Nari (Rural Women)*. Dhaka, Bangladesh: Abosar Prokashoni.
- Manovich, L., Malina, R. F., & Cubitt, S. (2001). *The Language of New Media*. United States: MIT Press.
- Millett, K. (2016). *Sexual Politics*. Columbia University Press.
- Morahan-Martin, J. (2000). Women and the Internet: Promise and Perils. *CyberPsychology & Behavior*, 3(5), 683–691. <https://doi.org/10.1089/10949310050191683>
- Narayanan, S. (2016). Historical Background of Gender Equality and Succession Right of Hindu Women's Right of Property in Tamil Nadu. Intel Prop Rights. *Intellectual Property Rights: Open Access*, 4(2), 1–14.
- Nelson, A., & Brown, C. D. (2012). *The Gender Communication Handbook: Conquering Conversational Collisions between Men and Women*. San Francisco, Calif: Pfeiffer.
- Odhikar. (2018). Statistics on Violence against women. Retrieved January 17, 2019, from </statistics/statistics-on-violence-against-women/>
- Parent, M. C., Gobble, T. D., & Rochlen, A. (2018). Social media behavior, toxic masculinity, and depression. *Psychology of Men & Masculinity*, No Pagination Specified-No Pagination Specified. <https://doi.org/10.1037/men0000156>
- Plant, S. (2000). On the Matrix: Cyberfeminist Simulations. In B. M. Kennedy & D. Bell (Eds.), *The Cybercultures Reader* (pp. 325–336). London: New York: Routledge.
- Preetha, S. S. (2015, May 16). Digital Sexual Harassment in Digital Bangladesh. Retrieved January 20, 2019, from The Daily Star website: <https://www.thedailystar.net/in-focus/digital-sexual-harassment-digital-bangladesh-82480>
- Riaz, A. (2014). *Culture of Fear: The Political Economy of Terror and Violence in Bangladesh*. Dhaka, Bangladesh: Prothoma Prokashan.
- Rukhsana, S. (2018, March 7). Love-marriage-relationships in social media: How much the women are empowered? *BBC News Bangla*. Retrieved from <https://www.bbc.com/bengali/news-43308304>
- Russell, B. (1996). *Power: A New Social Analysis*. London: Routledge.
- Sharp, A. M., Register, C. A., & Grimes, P. W. (1997). *Economics of Social Issues* (13th edition). Boston, Mass: Mcgraw-Hill College.
- Shibli, A. (2018, September 23). Why do women get less pay than men? Retrieved January 17, 2019, from The Daily Star website: <https://www.thedailystar.net/opinion/open-dialogue/news/why-do-women-get-less-pay-men-1637131>
- Spellman, J. W. (1964). *Political theory of ancient India; a study of kingship from the earliest times to circa A. D. 300*. Clarendon Press.
- Statistics of acid-attack. (2010, March 7). Retrieved March 20, 2019, from Prothom Alo website: <http://www.prothom-alo.com/detail/date/2010-03-10/news/47126>

- Stockard, J. (2006). Gender Socialization. In J. S. Chafetz (Ed.), *Handbook of the Sociology of Gender* (pp. 215–227). Boston, MA: Springer US. https://doi.org/10.1007/0-387-36218-5_11
- Tannen, D. (1990). *You just don't understand: Women and men in conversation*. New York: William Morrow.
- Taylor, S. E., Peplau, L. A., & Sears, D. O. (1999). *Social Psychology* (10th ed.). Upper Saddle River, N.J: Prentice Hall.
- TED.com. (2015). *Inés Hercovich: Why women stay silent after sexual assault* [Speech]. Retrieved from http://archive.org/details/InesHercovich_2015X
- UN Women. (2018). UN Women Bangladesh. Retrieved January 17, 2019, from UN Women | Asia and the Pacific website: <http://asiapacific.unwomen.org/countries/bangladesh>
- United Nations Development Programme. (2018). *Human Development Indicators and Indices: 2018 Statistical Update Team*. 38–39.
- Women aged 18 to 30 vulnerable to cybercrime: Study. (2018, May 20). Retrieved January 19, 2019, from The Daily Star website: <https://www.thedailystar.net/city/women-aged-18-30-vulnerable-cybercrime-study-1578969>
- Women elected for reserved seats to continue for 25yrs. (2018, January 29). Retrieved January 17, 2019, from The Daily Star website: <https://www.thedailystar.net/country/women-elected-parliament-reserved-seats-continue-25-years-1526773>
- World Bank. (2018, September). Unemployment, female (% of female labor force). Retrieved January 17, 2019, from <https://data.worldbank.org/indicator/SL.UEM.TOTL.FE.ZS?locations=BD>
- Zaytoun, K., & Ezekiel, J. (2016). Sisterhood in Movement: Feminist Solidarity in France and the United States. *Frontiers: A Journal of Women Studies*, 37(1), 195–214. <https://doi.org/10.5250/fronjwomestud.37.1.0195>
- Žegarac, V. (1998). What is Phatic Communication? In V. Rouchota & A. H. Jucker (Eds.), *Current Issues in Relevance Theory* (pp. 327–362). Amsterdam: John Benjamins Publishing.
- Zyma, I. (2018a, October 19). Why #MeToo is not happening in Bangladesh. Retrieved January 21, 2019, from The Daily Star website: <https://www.thedailystar.net/star-weekend/opinion/news/why-metoo-not-happening-bangladesh-1648678>
- Zyma, I. (2018b, October 26). Illusion of Inclusion. Retrieved January 17, 2019, from The Daily Star website: <https://www.thedailystar.net/star-weekend/spotlight/news/illusion-inclusion-1651771>

Media and Child Marriage *Assessing its Role in Creating Awareness to Stop Child Marriage in Bangladesh*

Salma Sabiha*

Abstract: Clearly, marriage is a cultural custom that ties individuals in an uncommon act of shared reliance. It helps in establishing and keeping a family. It's sort of a social practice which went into through a public demonstration, strict or conventional function. Marriage appropriately mirrors the reasons, character and customs of the general public in which it is found. Kid marriage has broad monetary, social, wellbeing, and political charges for the young lady youngster and her local area too. It manages a young lady's youth, makes grave mental and actual wellbeing chances, and denies her of universally acknowledged basic freedoms. Countless Bangladeshi young ladies are getting hitched ahead of schedule after pubescence, part of the way to permit their folks from a monetary weight and incompletely to keep the young ladies' sexual virtue. Where a young lady's family is extremely poor or she has lost her folks, she might be in intimate life as a third or fourth life partner to a lot more established man, to satisfy the piece of sexual and homegrown worker. Some are constrained into marriage at an early age. Media has an essential part to build mindfulness and produce conduct and social alteration to end youngster marriage in Bangladesh. To support the counteraction and detailing of kid marriage by urging individuals and networks to make a social development to hurry its end, media is each compelling cost to speak loudly against youngster marriage. The Government of Bangladesh has been exemplary with its respectable assurance to embrace innovative approaches to flood mindfulness and make a strong air for kids, their folks and social orders to make a move.

Keywords: Early Marriage; Media; Social Awareness; Government of Bangladesh

Introduction

Honorable Prime Minister of Peoples Republic of Bangladesh Sheikh Hasina repeatedly remarks that 'if you educate one man, you educate an individual, and if you educate a female, you educate a family and a society'. There is no miracle, girl's education has been turned free up to the level of higher secondary. Enrollment of girls in educational institutions, mainly in schools has been amplified after giving them stipend. This stipend has some specific conditions, and among them, one is that she cannot get married before she becomes the age of Eighteen (18). At present a total number of 3.9 million students are encircled by the special stipend programs (Amin, Ahmed, Hossain, and Haque; 2016).

Marriage is a societal tradition that ties people in a special practice of mutual dependence for the reason of making and retaining a family. As a societal exercise arrived into through a public act, spiritual or conventional program, it reveals the character, purposes and customs of the community in which it is made. Many communities have separate rules that bound the age of young girls to get married, but in some other cases the age boundary doesn't take into action their physiological preparedness for taking child. Marriage sometime takes place at ages too earlier than the lawfully ratified minimum age. Early marriage is the wedding of kids and adolescents below the age of eighteen years (National Children Policy; 2011). Marriages in which a child below the age of 18 (eighteen) years is seen occur globally, but are mainly involved in South Asia, Latin America and Africa.

* Lecturer, Department of Journalism and Media Studies, Jahangirnagar University, Savar, Dhaka-1342
Email: salmasabiha@juniv.edu

A large number of Bangladeshi girls are started conjugal life very soon after puberty, partly to allow their parents from financial burden and partly to keeping the girls' sexual purity. Where a girl's household is so much poor or she has lost her father and mother, she may be married as a third or fourth wife to a much older man, to satisfy the part of domestic servant and sexual. Some are forced into marriage at a very growing age. Others are in general too young to take an informed decision about their marriage partner or regarding the allegations of wedding itself. They may have assumed what passes for 'consent' in the view of convention or the law, but in realism, consensus to their binding union has been made by others on their behalf. Pregnancies that happen 'too early' – when a woman's physical condition is not fully mature – create a major threat to the endurance and future health of both child and mother. Parents and family heads make marital selections for daughters and sons with slight regard for the self-suggestions. Rather, they look upon wedding as a family-building approach, a financial arrangement or a mode to guard girls from unwanted sexual advances.

Poverty is one of the main issues behind child marriage. Where poverty is acute, a young girl may be seen as an financial or monetary problem and her marriage to a too older – and sometimes even ageing – man, an exercise common in South Asian communities, is a family persistence approach, and may even be observed as in her benefits. In convention a communities in Bangladesh, the bride's family may accept cattle from the groom, or the family of groom, as the bride value for their daughter. In Bangladesh, poverty-stricken parents are convinced to part with daughters through promises of marriage, or by deceitful marriages, which are used to trap the girls into prostitution abroad.

Wedding forms – together with other aspects of family establishment – are subject to severe 'development' forces such as decreasing profits from the land, rapid suburbanization, population movement, and the instability of global marketplaces, all of which are presently triggering profound societal disturbance and financial relegation. The product for families is cumulative destruction and the destruction of their prolonged arrangement. Families in the procedure of evolution may, therefore, be gathered between conventional and contemporary ethics. Men in search of work may join the eccentric world in town; while the women they wedded in their teens, and their children, remain their conventional lives in the rural areas.

Media has a vigorous role to increase consciousness and activate behavioral and societal alteration to end early marriage in Bangladesh. In order to encourage the anticipation and reporting of early marriage by boosting individuals and societies to create a social movement to hasten its end, media is every effective toll to raise their voices against child marriage. The Government of Bangladesh has been commendable with its noble struggle to accept pioneering ways to raise awareness and generate a helpful environment for children, their parents and societies taking action. This research endeavor will attempt to look at media's role in eliminating early marriage interacting with people.

Trend of Early Marriage in Bangladesh

In Bangladesh, child or early marriage is considered as one method to ensure that a spouse is 'protected', or involved firmly under male dominance; that she is loyal to her husband and serve dedicatedly for her in-laws' family; that the children she bears are 'legitimate'; and that connections of love between pairs do not demoralize the family

entity. In many states like Bangladesh, child marriage falls into what volumes to a permissions limbo. It may be forbidden in the current civil or shared law, but be extensively overlooked by usual and religious laws and exercise. This is common where weddings naturally take place according to normal rites and remains not registered.

Early marriage, which has occurred for periods, is a multifaceted matter, rooted extremely in gender inequality, convention and poverty. The repetition is most public in rural and impoverished zones, where views for girls can be limited. In many cases, parents organize these weddings and young girls have no choice. Poor families marry off young daughters to decrease the number of children they need to feed, educate and clothe. In some philosophies, a major enticement is the price potential husbands will pay for young spouses. Societal burdens within a society can lead families to wed young children. For instance, some values believe wedding girls before they reach puberty will bring sanctifications on families. Some cultures believe that child marriage will keep young girls from sexual occurrences and fierceness and see it as a way to assure that their daughter will not become pregnant out of marriage and bring disgrace to the family. Too many families wed their daughters just because child marriage is the only option they know.

Bangladesh has one of the uppermost rates of early marriage throughout the world and the maximum rate of wedding connecting girls under 15. 52% of girls are married by their eighteenth (18th) birthday and 18% by the age of 15. As well as intensely entrenched social and spiritual principles, drivers of early marriage include parents' aspiration to secure financial and societal security for their girls, poverty and the perceived need to ensure safety of girls from impairment, including sexual irritation. Dowry is also a pouring issue with prices often aggregate the older a girl grows. This economic burden often means that girls from poorer families are extra likely to be early brides (National Institute of Population Research and Training, 2011). Currently, legally the minimum age for marriage is eighteen for women and twenty one for men – according to the early/child Marriage Restraint Act 1929 (Government of Bangladesh; 2006).

In September 2014, actions were planned to lower the minimum marriage age for girls from 18 years to 16 years. On 24th November 2014, the cabinet division endorsed a draft of the Child Marriage Restraint Act 2016, headed by Prime Minister Sheikh Hasina at her office. According to the planned law, anyone under the age of 18 years, in general will be treated as a child. However, in terms of marriage, any male under the age of 21 years and female under the age of 18 years will be seen as minors. The new draft legislation also consists a rule of allowing child or early marriage in special circumstances, such as if a girl becomes pregnant illegally or accidentally, where a marriage will be allowed to protect her "honour" (Government of Bangladesh; 2017). Besides, on the hypothesis that economic limitations are the foremost motive for parents keeping their daughters out of school or colleges, a secondary school allowance programme for girls has presented in Bangladesh in the beginning of the 1990s. Fees and free books are delivered for the students, and their parents are provided some recompense for the damage of their daughters' farming and domestic work. One of the utmost conspicuous results is an unexpected rise in marriage rescheduling, as parents are requisite to sign a promise that their daughters would not wed before age 18. Parents replied to the inducements, partly because they saw that daughters with an enhanced education would marry men who are better benefactors.

Despite significant progress in improving gender equality and declining poverty in recent years, Bangladesh has one of the uppermost ratio of early marriage among girls among the whole world: two-thirds of women marry before the age of 18. The current law forbidding the marriage of minors is frequently ignored and rarely enforced. The Government of Bangladesh discusses that denying parents the lawful mandate to marry off their daughters can, inconsistently, lead to a higher occurrence of child marriage and make further social difficulties.

Literature review suggests that, in many cases lack of enforcement renders laws against child marriage ineffective in Bangladesh. Child marriage of girls and boys damages the comprehension and pleasure of nearly every one of their privileges. The nuisance of a marriage companion on children or adolescents who are in no way prepared for conjugal life, and whose wedding will divest them of liberty, prospect for individual growth, and other privileges including education, health and well-being and involvement in civic life, invalidates the meaning of the CRC's core defenses for those concerned. Unless actions are taken to address child marriage, it will endure to be a key stumbling block to the success of human rights. At present, there is a severe lack of data on all parts of child marriage. As this present undertaking has emphasized, the bases of evidences that do exist have inspected child marriage in terms of demographic tendencies, fertility, and enlightening attainment. There are as yet very few learningsthat have observed the exercise from a human rights viewpoint, in terms of movements or its effect on families, wives, husbands, or the wider society (Government of Bangladesh; 2016). These gaps must be filled immediately, since data must notify policies and programmes and deliver a basis for actual promotion.

Trend of Early Marriage: Global Perspective

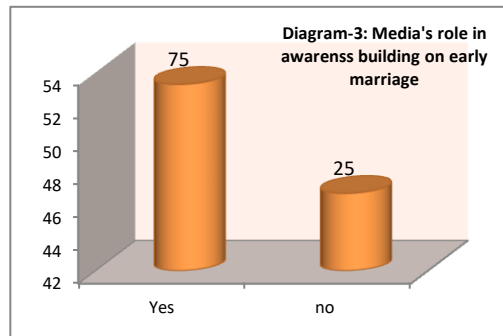
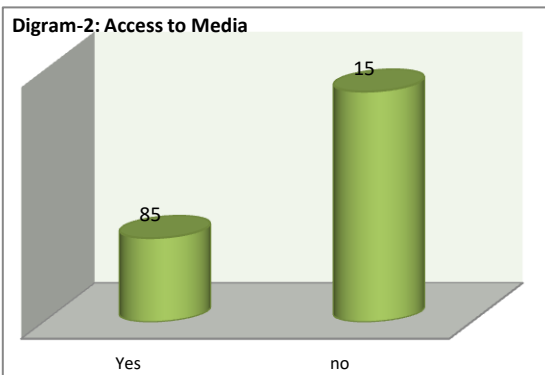
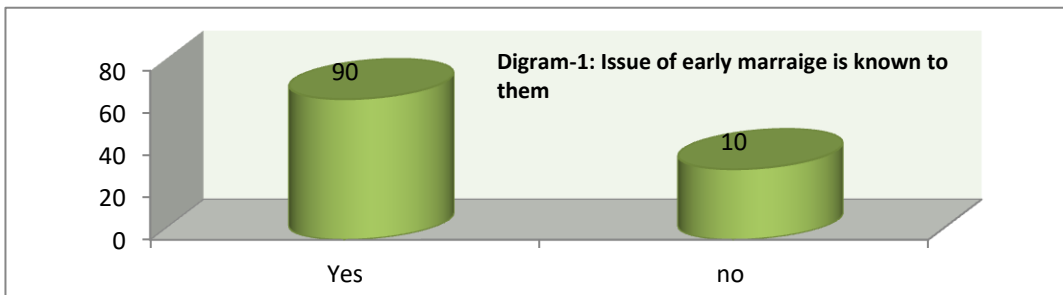
In the year of 2000, 08Millennium Development Goals (MDGs)sketched a vision that committed the member states to mitigate extreme poverty and reduce hunger, educate all children with quality education through primary school, foster women empowerment, reduce childhood death rate, improve maternal health, combat with HIV/AIDS and malaria, ensure sustainable environment, and createa strong global partnership for development by the year of 2015. Early marriage is vague and does not necessarily refer to children (Rutterford, Copas, and Eldridge; 2015). Furthermore, what is early for one person may be late for another. Child bride appears to elevate the process, suggesting a festivity and a bride who is pleased to start a loving combination with her spouse. But for the most of the time, girl brides don't know—and may have never met—their groom. Since 1948, the United Nations (UN) and other leading international organization shave tried to stop child/early marriage.

Media's Role in discouraging Early Marriage through Awareness Building: Study Findings

Understanding people's perceptions is crucial in order to promote communication with the blessings of media that motivates people to take action to improve their lives in Bangladesh. Perceptions are shaped by a range of factors including exposure to media, communication with peers, personal beliefs and values and education levels. People in Bangladesh are more or less aware of the adverse impact of early marriage and are

already starting to act, yet this action needs to be encouraged and built upon. There is a need for communication that encourages people to join hands to stop early marriage from the society. People also want more information on how to take action and develop new skills.

In order to capture the role of media in building awareness against the wave of early marriage, a short-lived study was undertaken in the entire month of January 2018 targeting 60 individuals on a random basis living in the Kalampur village of Dhamrai Upazila in Dhaka District. Only three questions were asked to substantiate the research intents and findings are presented in diagrams as follows:



Girls who marry at a young age are under countless force to show their fertility by bearing children immediately at a very early age. Girls who marry between the ages of 10 years and 14 years face the risk of maternal mortality five times during pregnancy or childbirth in comparison to mothers in their early 20s. Child/early marriage also force to isolation and can reason of depression. Some respondents also told that this types of females have very poor relations with their families. The problem of being hectic with household responsibilities was also mentioned. All these factors perpetuate the cycle of poverty and gender gap in terms of access to education and professional opportunities. Marginal level of education among parents and lower access to schools, especially in rural areas obstruct girls' education and increase the likelihood of early/ child marriage. In consideration of the above findings, it could be underscored that, communication with the support of media encourages discussion to raise awareness of the underlying risk and

challenges associated with early marriage. It could easily contribute to make the community more aware by the way of sharing relevant knowledge and adverse impact of early marriage.

How Media Complements the Government and other Actors in creating awareness? Some Encouraging Examples

Apart from my field based findings I have mentioned above, this section has exemplified how does media work closely with the relevant stakeholder's in accelerating the national drive against child marriage.

How UNICEF using Media to create awareness

UNICEF has the infrastructure where they said everyone has a role to play and something they can do.

Research: Acquire more about the influences and effects of early marriage

Refrain: Abstain from taking part in or presence early marriages within your family, neighborhoods and bigger communities.

Resist: Resist any tries that involve you in organizing or enabling nearly marriage.

Raise: Increase your voice against any early marriage that is being planned or taking place within your family, neighborhood or larger society.

Rally: Mobilize and linking with your friends, family, larger community, neighbors and local authorities to take action against early marriage.

Report: Reaching out to and notify your particular local authorities and administrations about any planned or happening early marriages within your family. neighborhoods or larger society. (UNICEF, 2011).



This promotion has been prepared under the Ministry of Women and Children Affairs and 'Enabling Environment for Child Rights' Programme of UNICEF.

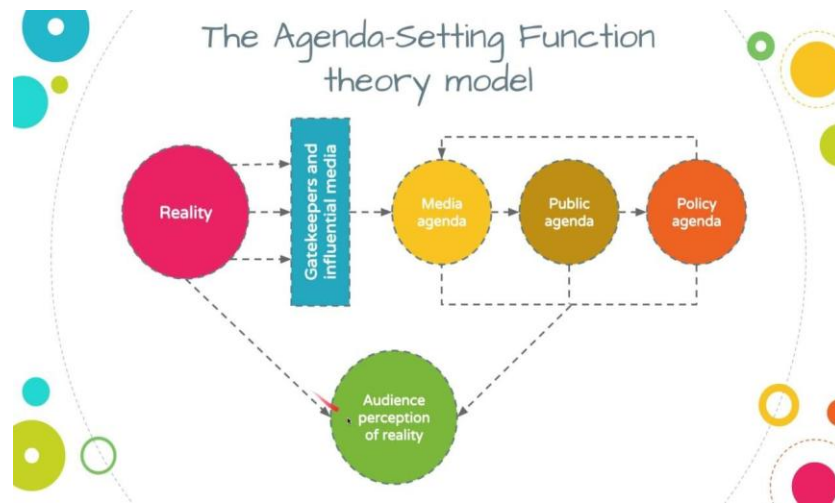


The television drama 'Ichhe Dana' is part of a larger community campaign by the Government of Bangladesh, which aims to change norms around gender roles and the practice of child marriage in the country.

Media is also encouraging some positive news where we can see our government is really doing great towards stopping child marriage and taking strong initiative. Our perception can be challenged by media whether it can be local or global. What I mean to say is media is kind of human face to the issue when we use it as advocacy. Like when we research and ask questions we can understand things from parent's perspective as well as a young girl's perspective. Both can be challenged by media advocacy. Media advocacy works with emotional and personal content and that help us to show the public and decision makers that the exact numbers and opinion of general people (PLAN International and Coram International; 2015).

In communication theories we often talk about Agenda Setting theory. Let's describe it shortly. Agenda-Setting concept defines the capability of the media to impact the significance placed on the topics of the public agenda. That is if a news item is enclosed regularly and obviously the audience will concern the issue as more vital.

So role of media is undoubtedly important to shape general peoples mind on child marriage issue.



How can Media do its part to create more awareness?

- * Media need to be more focused on this issue with passion,
- * Media people need to understand this is a social welfare issue.
- * Media need to engage youth community to spread this awareness more.
- * Media must and should eradicate the negative perception perceptions
- * Media need to be more committed to the fact that child marriage is illegal. Girls are not brides.
- * Media need to be more careful while representing women. They need to give proper respect portraying women ethically and responsibly.
- * Media has to be accountable to the communities and social awareness topics.
- * Media with the help of civil society organizations need to be more opportunistic to expand the reach of the media stories.

We often watch the famous cartoon 'Meena'. Have we ever critically thought why this character being so popular where we easily pushes general peoples mind towards women empowerment without distracting social taboo. Now a day how we portraying women in media is a matter of question. Film, Advertisement, Videos songs everywhere we sale them as a product. But not in a good manner obviously. I think its high time media need to be more conscious on women empowerment and respecting them as an individual human being. Media also need to be more careful while they are showing female children. They shouldn't represent them with lots of makeup or a big girl costumes. They are mean to be child at this age and not to become models.

We need more movies like No Dorai using media to reach more people

This film based on women's emancipation, achieving dreams by overcoming social obstacles hence this movie titled NODORAI where a young girl is fighting for her dream but society is not allowing her.

The plot is unique and based on the rural crucial social issue of our country which described the scenario where Bangladeshi society is built upon what women can do and cannot do. And here we can see how a teenager girl has to fight against early marriage. So I think these kind of movies need to be praised.

Birth Certificate for everyone

Birth certificate need to be issued for every child. But it need to be the original, in Bangladesh we noticed some fake certificate registrations as well. When a child is born in Bangladesh it has to be mandatory. So in future when it's a matter of marriage legal procedure can be done easily.

Marriage Registration:

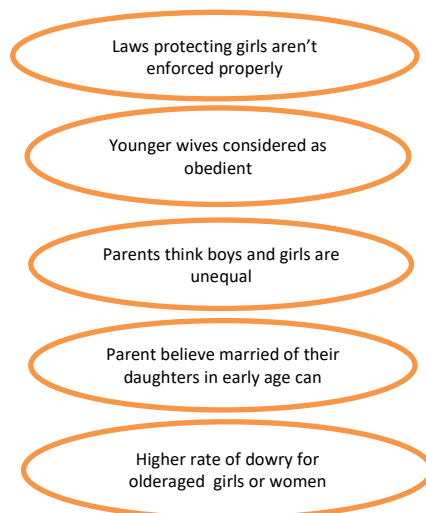
Marriage registration is mandatory in Bangladesh and every marriage should be registered. Based on the law it is an official document which can regulate the exact rights and responsibilities of a wife and husband and children.

Child marriage is a kind of child abuse:

So when law is protecting pedophiles how can we protect our girls? If a girl is a victim of rape how can we just give justice by letting her married of with someone and not letting the girl live her life by her own choice. So question arises and still urban people are confused on this issue while rural people may take it as a weapon to practice this ill social custom of early marriage.

Now the question is how we can protect a girls honor by not giving her chance to live in her own terms rather make her a wife and mother before her age without her consent! So media need to be more careful while presenting the laws and representing it with their tools. Also we must understand there is a group of people always want women to stay indoor so we must understand the critical thinking behind these.

Why Early Marriage Happens:



Consequences of child marriage:

Early marriage is one of the most dangerous social stigma of our culture. It's a harmful practice. Girls married early are more like experiencing vulnerable life.

They have to suffer with-

**Conclusion**

Apparently, the government is firming the legal framework to prevent early or child marriage and deliver authorization and remedies when such cases occurred. We trust that, children, both girls and boys, should be safe from the curse of early marriage by giving them with quality-full education, and accessibility of social services, information and knowledge. A defensive situation at the societal level is very significant, mainly for young girls to keep themselves from exploitation, sexual harassment, or assault. To prevent or stop early marriage, we need to set up volunteer institutions which can vigorously work to monitor issues related to this problem. The media can perform a big role in resolving this issue. Not only the mainstream media, but their stakeholders, sponsors and partners can also play an important role, through joint-initiatives with their other media partners.

References

- Amin, S., J. Ahmed, J. Saha, M. Hossain, and E. Haque. 2016. "Delaying child marriage through community-based skills-development programs for girls: Results from a randomized controlled study in rural Bangladesh." New York and Dhaka, Bangladesh: Population Council.
- Government of Bangladesh, Law Commission of Bangladesh, A Final Report on the Proposed Amendment of the Divorce Act 1989 along with a draft of the Divorce Act, 1869 (Amendment) Bill (2006), available at <http://www.lawcommissionbangladesh.org/reports/72.pdf>.
- Government of Bangladesh (2017), the Child Marriage Restraint Act 2017, Ministry of Women and Children Affairs.
- Government of Bangladesh (2016), the Child Marriage Restraint Act 2016, Ministry of Women and Children Affairs.
- National Children Policy (2011), supra note 80 at 6; Government of Bangladesh, Ministry of Education, National Education Policy 2010, 41, available at <http://reliefweb.int/sites/reliefweb.int/files/resources/02.National-Education-Policy-2010-English.pdf>
- National Institute of Population Research and Training (NIPORT), Mitra and Associates, and ICF International. 2013. Bangladesh Demographic and Health Survey 2011. Dhaka, Bangladesh and Calverton, Maryland: NIPORT, Mitra and Associates, and ICF International.
- PLAN International and Coram International. 2015. Getting the Evidence: Asia Child Marriage Initiative—Summary Report. https://www.plancanada.ca/file/planv4_files/biaag/Getting-the-Evidence_Asia-Child-Marriage_summary.pdf. Bangkok, Thailand.
- Rutterford, C., A. Copas, and S. Eldridge. 2015. "Methods for sample size determination in cluster randomized trials," *International Journal of Epidemiology* 44(3): 1051–1067.
- UNICEF, Birth Registration in Bangladesh, 2 (2010), available at [https://www.UNICEF.org/bangladesh/Birth_Registration\(1\).pdf](https://www.UNICEF.org/bangladesh/Birth_Registration(1).pdf).
- White, S.C. 2017. "Patriarchal investments: Marriage, dowry and the political economy of development in Bangladesh" <https://unb.com.bd/category/Bangladesh/sirajganj-executive-magistrate-honoured-for-stopping-child-marriage/29225> accessed on 1 July 2020
- <https://www.dhakatribune.com/bangladesh/nation/2018/10/19/report-number-of-child-marriages-declines> accessed on 21 June 2020
- <https://www.dhakatribune.com/bangladesh/2019/09/14/nipping-child-marriage-in-the-bud> accessed on 12 May 2020

Sidewalk and Traffic Intersections: An Urban Anthropological Evaluation of the Spatial Organization and Practices of Dhaka City

Kazi Ashraf Uddin*

Abstract: The ever-increasing demography of world's one of the most densely populated cities of a so-called developing country and its inconsistent urban spatialization and urban practices have turned the urban geography of Dhaka into a chaotic one. Due to an irregular and oftentimes hegemonic "spatial practice" (borrowing Henri Lefebvre's term), spaces on the urban landscape of Dhaka are used, reused, misused, and not to mention, abused. In line with urban anthropology's critical concern, this paper takes up a two empirical case studies of spatial practices within Dhaka city's urban site - one is the informal spatial economy of hijras at the traffic signals while the other is the expansionist re-decoration of the front gate of the Headquarters of Border Guard Bangladesh (BGB) situated at Sat Masjid Road along Dhanmondi neighborhood - and investigates into the political, social, economic and cultural influences that shape the spatial practices and ensue spatial restructuring of our everyday urban life. In doing so, this paper also locates the issues of inhabited expansionism, social/urban justice and 'right to the city' (Lefebvre, 1968; Harvey, 2008) and casts a curious look at the transforming notion of citizenship rights and the role of the state/military policy in structuring city life. Adopting the methods of empirical data analysis and participation observation, this paper attempts a critical investigation of our urban geography, how it continuously reshapes our social relationships, and ensues new facets of urban struggle for existence, both spatial and economic. To put in simple terms, this research explores two central issues of urban anthropology in Bangladeshi (Dhaka) context: spatial practice of urban space and ensuing social relationships and encounters.

Keywords: space and power spatial practices, Henri Lefebvre, spatial justice, spatial economy

Introduction

Public space might logically be deemed as a spatial entity, which is not owned privately. Some scholars include in their account of public spaces those which are used by the general public even if they are privately owned. A good example in this regard might be the shopping mall or the Internet. The latter example indicates that public space is not always defined in purely physical terms but can include digital space as well. Generally speaking, we might think of public spaces those realms in which the general public claimed a stake in ownership, use, access, participation and regulation or some combination of the above. Jaffe and Koning contend that urban public space is a space of "freedom and anonymity where individuals can reinvent themselves, engage in new types of encounters and develop new forms of sociability" (2016, 55). However, they also account for the "ongoing struggles" for a convivial experience in public spaces (55). Increasingly, we have come to conceive of public space is that which is defined by state ownership such as the public park, the street, the sidewalk, the square, the subway or City/Town Hall. However, such public spaces, as Henri Lefebvre argues, have dynamic facets which oftentimes change its character based on how such spaces are used, demarcated, semiotically manifested. For instance, an urban place which once was a public park open to everyone might restrict the access to the third gender after a

* Associate Professor, Department of English, JahangirnagarUniversity, E-mail: ashraf@juniv.edu

conservative authority takes up the power of the City Corporation thus rendering them outsider or infiltrators. This paper examines two case studies, one involving the spatial practice of the major traffic signals while the other is connected to the spatial restructuring through structural decorations at the main gate of Border Guard Bangladesh (BGB) Headquarters, both situated within the urban vicinity of Dhaka city. Sharing the disciplinary interest of Urban Anthropology and critical focus of spatial criticism, this study tends to read how spatial practices and spatial restructuring/reorganization produce novel social relationships thus rendering new identities and a dynamic cartography of the city. In doing so, this paper also locates the issues of inhabited expansionism, social/urban justice and 'right to the city' (Lefebvre, 1968; Harvey, 2008) and casts a curious look at the transforming notion of citizenship rights and the role of the state/military policy in structuring city life. Thus, casting a close look at how spatial restructuring repositions everyday practice and public motorway is repurposed for casual spatial economy. This paper finally attempts to understand the intervention of power into spatial practices and behaviour.

Study area and methodology

For this research, I had to observe use and repurposing of urban space as a small-scale local phenomenon. For the case study on the hijra presence, this study particularly uses Mirpur Road (Dhaka) and the second case study is specifically relating to the spatial restructuring of the main gate of Border Guard Bangladesh (BGB) situated in the vicinity of Dhanmondi Residential Area of Dhaka. This observation (for both case studies) spans over a period of one year from June 2018 till mid 2019. Being a resident of an adjacent neighbourhood, I have to use this passage as my frequent route to my quotidian movement. Hence, my access to these spaces has been facilitated due to my familiarity with this neighbourhood. Hence, as a middle-class inhabitant of this neighbourhood, the issue of cultural relativism has never been a contentious issue for me. My intervention with this place as a participant observer and my informal/casual interaction with the common pedestrian helped me to understand how both a) spatial restructuring affects everyday life, and b) public space is repurposed for informal economy.

For this empirical research, data gathered through close participant observation as city pedestrian along BGB area and as regular commuter through Mirpur road, the place from where I recorded my empirical data of the hijras' use of traffic intersections as a means of their space- (public road) and traffic-dependent informal economy. In case of BGB's decorative expansion of its territory, I closely observed the way how, due to such expansion, the pedestrians over the months have re-routed their movements from the sidewalks sometimes overlapping the public road. As for the hijras' repurposing of public road, I myself was a contributor in their economy, thus a participant, and also repeatedly observed the pattern of their informal economy and how their ritualistic money-collection has become everyday practice. In short, both these points of urban space have been the part of my daily trajectories across urban landscape. I myself being a sidewalker and commuter of the same space the experience and reconstruction of which has been studied for this research, I did not go for any interlocutor for my data collection. Therefore, in this research data has been collected through participant observation applying what Maréchal calls autoethnographic method (2010, 43).

Case Studies and analyses

1. *Transgender visibility at metropolitan traffic signals:*

A common everyday experience of private-car/ automobile passengers stuck at the traffic signals and jams in Dhaka is that they are approached by the hijras seeking alms (Fig. 1). Depending on the transgender concentration of Dhaka city area, such hijra presence at the



Fig. 1: Hijras begging alms at traffic intersections.

signals varies. Due to a general stigma and discomfort of the urban people (or even the collective population) towards the transgender community, hijras are economically and socially pushed towards the blur and insecure periphery of the society causing social and economic insecurity in them. Hence, such social and occupational ostracism delimits and thus specifies the transgender visibility in the city area. The metropolitan area becomes almost a 'no place for hijra' ensuring their minimal visibility. However, as a common source of income hijras beg for alms to those apparently well-off car or other automobile riders. The selection of cars and/or automobiles with low ground clearance as the potential financial source relies on two principal factors: the riders' economic class/ solvency and reachability of car/automobile passengers (i.e. low window position, individualized space). Such hijra presence at traffic signals evokes some common behavioral responses and movements among the car passengers which include: waving hands expressing inability to help, being busy with cell phone, pretending to take nap, pretending not to have seen them *etc.* Such spatial responses of urban population to hijra intervention underline the social segregation of the city. While asking for help, hijras engage in brief verbal exchange, smile/anger-exchange with the car/automobile riders. The few seconds'/minutes' interaction between the hijras and the automobile passengers contains much hope and sometimes frustration or anger among the hijras while frequently an escapist attitude among the passengers. Segregated by a heteronormative power structure, the traffic signals serve as their site for interaction, if not assimilation or integration.

Such urban space generates a kind of economy and becomes the site of a kind of space-specific earning, a kind of spatial economy which reiterates periodically as long as there is traffic on the road. However, a vacuum or scarcity of traffic due to any urban emergency such as lockdown during the Covid 19 pandemic or political unrest such as strike minimizes such spatial economy and pushes the hijras into invisibility and albeit, hunger and poverty. Hence, urban automobility (use of automobiles for transportation) is a pre-requisite for such producing such spatial economy. Traffic signals or traffic jams thus appear to be an opportunity for the hijras to generate such economy. Paradoxically, while urban automobility is one of the essentials for the hijras to earn their living,

immobility (traffic jam, long signals) of urban automobility is that helps them more to try their luck in collecting alms. Traffic signals thus become a means of production for the hijras and thus contribute to their urban survival. The utilization of urban space by the hijras thus produces capital as well as creates a site for their social interaction even if briefly. From the perspective of the car-riders, they see the marginalized or almost invisible hijras thus getting an idea about the heterogeneity of gender presence. Traffic signals thus become the site for hijra interactionism and create a novel conception about the reproduction of urban space. Such dialectic state of space is what Lefebvre calls *espace conçu* or conceived space, a notion which is informed by how we live a space (1991, 31). Lefebvre's Marxist assumption of space as social product has its resonance in the study of urban spatial practice. Lefebvre famously argues, "Every society and hence every mode of production produces a (social) space, its own space" (1991, 31). Such material conception of space denies spatial existence as a "preexisting void" or a "static construct", rather vouches for space as "dialectically interwoven matrix" (qtd in Wolfreys, 2015, 236-237) construing and reconstruing its utility and hence revising the representational facets of space. Since the hijras' livelihood is contested in most other places within the urban location, the traffic signal becomes a site for the representation of urban political economy. The hijra presence at the signals also signals at the uneven spatial arrangement or accommodation of the urban geography. Hijras' conditional sharing of their earning with the physically challenged alms-seeker puts them into a "circuit of capital" (Lefebvrian term) production and distribution. I call it an urban-street capital.

Different points of urban public space become (trans)-gendered space during the traffic signals and the urban economic and gender inequality becomes visible in these brief intervals. Such gendered feature of the urban social space hints at the crisis of transgender visibility across the urban landscape thus questioning the notion of public space as accessible to all urban dwellers. It seems that the re-appropriation of the stigmatizing urban slur "street girl" has become a means of survival.

2. *BGB's protruding elephant statues: Goodbye, Pedestrians!*



Fig. 2: Two of the five elephant statues occupying the footpath in front of BGB Headquarters

Border Guard Bangladesh (BGB), the main border protecting paramilitary authority of Bangladesh, has recently placed five colossal plastered elephant statues at one of its front gates (Fig. 4, Gate no. 4). BGB Headquarters, a paramilitary establishment already situated in the heart of Dhaka metropolitan area, has pushed its geographical line farther onto the urban public space, the sidewalks. The structural and aesthetic expansion of a

military establishment into the urban vicinity raises the question of spatial justice, citizenship rights and above all, the ‘right to city’. Moreover, such spatial practice redefines the limits of social relationship and creates new discourses of urban experiences of everyday life. As figures 2 and 4 illustrate, the decorative elephant statues facing onto the street occupy the pivotal footpath space reserved for the urban dwellers. Two things happen in this case- either the expansion of military space into civil/ urban territory or civil space yields to military space. Such expansion in the form of occupation denies/reduces the right of the citizens to utilize the urban space for their movement and forces the city-dwellers, pedestrians to be invaders of the urban street as they are now forced to walk on the street. The sign post in the middle of the footpath which is now occupied by the BGB administration symbolically establishes a inviolable prohibition saying “□□□□□□ □□□□□□” (“Parking Not Allowed”) and the sign-post stays right in the middle of the footpath blocking the smooth movement of the passer-by. Such occupation functions as a display of unequal hegemonic power relationship between the military and non-military population and oftentimes are justified in pretext of public safety. The imperial symbol of elephant as the material occupier of the space adds to the hegemony. An intervention into cityscape by military establishment is termed as military urbanism referring to a spatial negotiation between the metropolitan/urban authority and



Fig. 3: Protruding elephant statue occupying sidewalk

the Military administration. Building of fortified gates, barracks, cantonments and other components of military operation in the heat of urban landscape leads to the militarization of cityscape. Such militarization bears the sensitive justificatory arguments of nationalism, sovereignty, and collective good and so on, the questioning of which might lead the individuals to encounter disciplinary and policing regulations.

Elephant plays an important role in the Indian Sub Continental imperial history. India was the first nation to start and the last nation to stop the use of elephants in imperial warfare starting from the 15th century B.C. A king’s wealth was measured by the number of elephants he had. Wars were often fought over territories which have a great deal of elephants thus making elephants a war motif. Chanakya’s account states that the Indian emperor Chandragupta Mourya had more than 21000 elephants. We also hear of war elephants which were heavily armored and were used as tanks. Warriors used to mount on the elephants in a chariot-like structure placed on its back. A very common use of elephants was placing them as mobile fortresses while the rest of the soldiers used to rally around. The monarchical history of Dhaka from the 16th century till the arrival of the British bears witness to the emergence of Dhaka as the economic and political centre. Mir

Jumla, the renowned subahdar of Bengal under Emperor Aurangzeb, has decided to turn Dhaka as his administrative epicenter (Islam, Miah, Khanam & Ahmed, 2012). From that period on, Dhaka has encountered modifications in its urban geography to the presence of the royal families. Places like Pilkhana (Elephant Stable), Elephant Road, Hatirpool (Elephant Pool), *Hatipota* (near Buriganga) and Hatirjeel (Elephant Lake) bear the legacy connected to the grooming and taming of elephants for different royal and military purposes.



Fig. 4: BGB Gate no. 4

However, all these legacies date back to the pre-British period, i.e. mainly during the Mughal regime. Even during the Mughals, the elephants used for military purposes and/or as status symbol do not have any indigenous connection with the geography of Dhaka, most of those elephants were imported from Assam (now part of India). Border Guard Bangladesh (BGB) was previously known as BDR (Bangladesh Rifles) till 2011 and used to be known as East Pakistan Rifles (EPR) during the Pakistan period from 1947. During this period of almost 75 years assuming three different names (Islam *et al.*, 2012), BGB as a paramilitary force has never used elephants as a part of their operations; nor their badge/ logo does not bear any sign of elephant or whatsoever. Just because the place where their Headquarters are situated (Pilkhana, Dhaka) has once been used as the resting, nurturing, grooming place for the elephants of the rich landlords of the Mughal period (Mamoon, 1993, 154), does not substantially justify of five protruding elephant statues at the BGB gate occupying public space. Hence, even though elephants might carry some legacy with the Mughal history of Dhaka, it has no paramilitary connection with Border Guard Bangladesh, a powerful and responsible entity for a protection of our national borders. Following this brief account, we cannot really attach any semiotic significance of the elephant symbols in the form of aggressive statues occupying public space and forcefully rerouting urban mobility.



Fig. 5: Original master plan BGB Headquarters gate

The placement of a paramilitary establishment in the heart of a civil residential and shopping area itself represents an act of militarization of urban space. During occupational war, as we all know, militaries are instructed to avoid the civil localities whereas the deliberate positioning of BGB headquarters may invite collateral damage as we have seen a few bystander civilians dying during the BDR mutiny of 2009. Such casualty is obvious and can be avoided by re-spacing or re-positioning the military establishments. Military or paramilitary establishments have some essential yet confidential components by its own rights. Hence, urban intersectionality of military entity might put things in jeopardy and impose undue restrictions on civil life. Moreover, militarization of urban space has its own intra-colonial trope embedding surveillance, control, restrictions, and/or punishments upon urban life.

The master plan of the BGB Pilkhana gate also has a faulty adjustment where the surface extension of the gate reaches the main road deleting any space for footpath for the bystanders. And, the addition of the elephant statues farther completes the annihilation of public footpath. Such spatial violence and urban maladjustment lead to urban discomfort, violation of citizen rights, and sometimes lessening of military credentials. Oftentimes, such discomfort of civil population leads to fear. Elephant statues protruding from the fortified gate of a paramilitary establishment pose a symbolic threat to the pedestrians which hints at the imperial interests of the state. They become more frightening than the real elephants striding along the urban street of Dhaka collecting tip with the help of their mahouts. The military spatial expansion causes civil spatial contraction (redaction of public space) and thus evokes the question of social justice. The passage from civil space to a designated military space occurs as a result of occupation and such expansion re-demarcates the urban cityscape, redefines the freedom of movement, and actualizes the civil-military relationship. By actualization of civil-military relationship, I mean the production or modification of social relation in accordance to the use of the space, the spatial practice as Henri Lefebvre (1901-1991) calls it. Henri Lefebvre puts forward his arguments about the dialectic and social status of space in his seminal book *The Production of Space* (1991, originally published in 1974). Lefebvre points out “that (social) space is a (social) product” (1991, 30) referring to the dynamic characteristic of a space which is continuously being used and repurposed thus creating different sets of

social relationships at different moments. Thus, the once law-abiding pedestrians walking on the footpath become the enforced jaywalkers on the main street; or if the same pedestrians walk along the footpath adjacent to BGB gate, they are detected by the policing CCTV and are now termed as illegal infiltrators. Thus, the military expansionism redesigns the urban space and therefore, produces new social relations.

The front gate of the Bangladesh Border Guard's Headquarters occupying the footpath thus forcing the pedestrians to walk on the street thus risking their lives and forcibly destabilizing the urban commuting. The aggressive image of the gate with five elephants coming out has its symbolic connotation. Elephants are historically and mythologically commonly deemed as the symbol of power and wisdom, two metaphors significant for domination. Lefebvre, referring to the real estate investors' spatial occupation, understood such occupation as "the dynamics of the settlement space" (qtd in Gottdiener & Hutchinson, 2011, 81), a space by creating or placing object/ establishments. With reference to Lefebvre, Hutchinson and Gottdiener point out, "Government places fire stations and police departments in separate locations across the metropolis in order to respond to distress relatively quickly. The state controls a large amount of land and utilizes it in its administration of government" (2011, 81). BGB as an auxiliary force of Bangladesh Army under government's Ministry of Defence has a similar military function in the country to secure the borders and to aid Bangladesh governments in crisis and emergency moments such as national election, civil unrest etc. The military and state backup of BGB has already empowered it, however, such practice of expansionism by eliminating public space and swallowing it for its own décor, puts the military administration and non-military, civil urban citizens into a conflicting dialectic and redefines their mutual relationship. The in-built power mechanism that BGB holds and may expose as a form of urban power entails an under-cover cultural discomfort and needless to say, spatial inconvenience. We need to understand that such pervasive spatial practice might end up to embittered liaisons, which has strong impact on the society. The conversion of urban/social space into military space restricts the urban pedestrians automatically from the general right to walk on the footpath forcing them to walk on the street amidst heavy traffic. The pedestrians' status shifts from the rightful side-walkers to unlawful squatters of public street. And, that formulates the implied logic of the sidewalkers' diverted urban mobility. Such spatial practice or spatial (ab/mis)-use has both material consequences such as traffic congestion, accident and abstract consequences such as culture of mutual mistrust, grudge and consequently intolerance. However, though, side walkers

Within the exclusion-occupation parameter, the spatial geography undergoes a dynamic transformation and such transformation helps us locate the social modifications and their impact on the urban space. Thus, academics' concern in social justice or Lefebvrian notion of 'right to city' is a crucial follow-up of the spatial reading of urban space.

Scope for further research

Within the feminist and sociological scope, the first case study may be furthered to investigate into the politics of social and gendered exclusion and how such cultural politics emerge into a novel re-conceptualization of urban space. Considering the second case

study, i.e., military urbanism, we can farther look into the aspects of capitalistic expansionism of military establishments, a phenomenon that David Harvey calls ‘spatial fix’ (2001) and read how such expansionism negotiates with the urban space. Case studies can be conducted on the military-run financial and commercial organizations such as “Shimanto Bank” (BGB-run bank), “Shimanto Square” (BGB-run commercial space), Shimanto Convention Centre (BGB-run convention centre), Shimanto Shambhar (BGB-run super mall) and so on. We can cast a spatial focus on the intersections of urban demography and geography and see if concentration of urban demography is really the one that matters, a concept that alludes to Henri Lefebvre who argued that demography is not the point that causes trouble in urban geography. The intervention of culture, economy, policy and ideology in the restructuring of urban space can be a departure point for urban anthropology in Bangladeshi context. Furthermore, a comparative study between Chinese Military Capitalism and Bangladeshi Military Capitalism may open up new avenues of critical understanding about military urbanization intersected by military capitalism.

Conclusion

Social science research opens up new paradigms of urban space and leads us to an intersectional dynamic understanding of space. Such understanding may contribute to urban planning and urban policy making. The critical insight about a space and its relation to the human agents it accommodates is crucial developing urban epistemology. This essay assumed a socio-spatial perspective of urban sociology in order to explore a few urban places, to interpret how these spaces interact with humans and how, when restructured, these spaces redefine the human-to-human relationship. For the case study of the hijras at the traffic signals, it is crucial for us to understand how a public motorway can serve as a source of informal economy like *tola* collection. Or, for the case study of the BGB headquarters gate, the study of sidewalk and its occupied status can be a vantage point to locate the daily negotiation of inequality and injustice. It is also important to see how the material and infrastructural organization structures our urban experience, i.e., traffic congestion. Besides, paying close attention to urban space and its transformation through the workings of urban economy, politics, power and governance, this essay attempted to understand the heterogeneity of urban space and contestations involved in it. With an understanding of the ideological and socio-economic politics that shape the urban encounters involving the space, such sociological study engages in the academic discussion regarding the perceived, conceived and lived status of space. Lefebvrian approach of spatial study with a Marxist preoccupation thus challenges the monolithic dimension of space; rather opens up the spatial agenda with pluralistic possibilities.

References

- Gottdiener, Mark and Ray Hutchinson. 2011. *The New Urban Sociology*. Philadelphia: Westview Press.
- Harvey, David. 2001. “Globalization and the “Spatial Fix.”” *Geographische Revue*. 2 : 23-30. <http://www.geographische-revue.de/archiv/gr2-01.pdf>
- Islam, Sirajul, Miah, Sajahan; Khanam, Mahfuza; Ahmed, Sabbir, eds. 2012. “Mir Jumla”. *Banglapedia: the National Encyclopedia of Bangladesh* (Online ed.). Dhaka: Banglapedia Trust, Asiatic Society of Bangladesh. Retrieved 03. 03. 2020.

- — —, 2012. “Bangladesh Rifles”. *Banglapedia: the National Encyclopedia of Bangladesh* (Online ed.). Dhaka: Banglapedia Trust, Asiatic Society of Bangladesh. Retrieved 03. 03. 2020.
- Lefebvre, Henri. 1991. *The Production of Space*, London: Blackwell.
- Mamoon, Muntassir. 1993 (2017). ঢাকা : স্মৃতি বিস্মৃতির নগরী : প্রথম খণ্ড (*Dhaka: Smriti Bismritir Nagari, Vol. 1*). Dhaka: Ananya Publishers.
- Wolfreys, Julian. 2015. *Introducing Criticism in the 21st Century*. Edinburgh: Edinburgh University Press.
- Jaffe, Rivke and Anouk de Koning. 2016. *Introducing Urban Anthropology*. London: Routledge.

Rural-Urban Migration and the Livelihood in Urban Area: The Case Study of Savar Upazila

Mohammad Safiqul Islam*

Abstract: This paper attempts to find the several factors which are liable for rural-urban migration respective the country. Mostly, migrants working as garments workers and other professions living in the Savar, as it is closer to the Capital and industrial area in Bangladesh, are selected as a study area. About 60 respondents were interviewed for this study purposively to know migration's reasons from the rural area. We have interviewed the migrants' household heads to assess migration factors and chosen randomly from the population. The statistical tools are used to analyze migrants' aspects and find pull and push factors responsible for the migration towards the city. They have a better income and living standard in an urban area.

Introduction

The famous theory of Lewis and Fei-Ranis about the "surplus labor" in the rural area took the attention and influenced the policymakers in many countries. With the development in various sectors, it is necessary to attract surplus labor from rural areas to metropolitan. People started to migrate from rural to urban first to look for a job second; there is a wage gap between rural and urban areas. Due to this Migration, productivity in the metropolitan area has increased tremendously. The migrants' remittances, attained knowledge, and skill transmission will also add to the development in rural areas. Rural-urban migration thus considers a route for poverty mitigation and stable growth in a labor surplus economy.

Migration considers the movement of individuals from one area to another, which are temporary or permanent. The migration decision depends on the people's necessity, geographical location, and it varies from one individual to the other individuals. Migration may be a particular method poignant people or families for economic, social, academic, and demographic reasons. Migration happens in human life due to economic development and social, cultural, environmental, and political factors, and their effects we also observed on place of origin. Folks tend to maneuver removed from an area because of having to be compelled to escape from violence, political reasons, drought, congestion in numerous dimensions.

In less developed countries, we observe that the migration rate is higher than the jobs are available in the industries and the social services sectors. Then they are engaged in the informal sectors in the urban area as vendors, rickshaw pullers, day laborers, etc. Another pull factor for migration is urbanization, responsible for residence problems, education, health care problems, water, power supply problems, and environmental degradation. Unless good jobs create in the urban area, it should be restricted the unplanned migration, unless the unemployment in the metropolitan area will be higher than the rural area.

In this modern world, urban-rural migration is a common phenomenon for any country. Influenced by family members, neighbors, and other reasons arise from society due to the

* Professor, Department of Economic, Jahangirnagar University, Savar, Dhaka
Email: msafiqi2004@juniv.edu

social structure changes. There is a focus and attention on migration, but as a researcher we are not involve intensively to know the reasons of rural-urban migration and it effects on the rural development and changes. This paper, therefore, has investigated the factors that are related to the rural-urban migration. This study examined factors related to people's movement from rural to urban areas and some of the migrants' socio-economic characteristics as a case study in the Savar area, as it grows faster as an industrial zone compared to other places.

Literature Review

Lewis's (1954) work on "Economic development and unlimited supplies of labor" was the previous work connecting rural-urban movement, which tries to enlighten the development route as a physical amendment relating alteration from a festering economy agricultural economy to a faster industrial growing sector. According to his argument, economic growth accelerates in both areas. Lewis presumed two sectors as the agricultural sector and industry sector in an economy, and there occur diminishing marginal productivity in both sectors. The Lewis model's prime assumption was "surplus labor" in the agricultural sector, and the marginal productivity of those surplus workers is closed to zero. Therefore, a substantial percentage of agricultural labor can be lifted, without undesirably disturbing the agrarian output, into the industrial sector where the wage rate is more than the agricultural sector.

This migration of labor continues until the low wage area's dense population migrates to the high wage areas in the urban areas. There have some gaps in the Lewis model, ignores the role of foreign trade and the human capital theory. Even is there any surplus labor in the traditional sector? Or what was the real difference in the wage between these two areas? As in the urban area, the costs of living is higher than in the rural area.

Ranis and Fei (1961) addressed the dualistic development model by encompassing and ratifying the Lewis model by familiarizing technical progress possibilities in the agricultural sector. Also, they anticipated that capital investments are also allowed in the agriculture sector. They have concluded that the "take-off" period may prolong for the developing countries if the rate of population growth increased and vice-versa if the investment increases in both sectors.

Studies by Okpara (1983) find once the people migrate from rural to urban areas, the quality of life decreased compare to the rural area consumption as they do not have the same bundle of consumption in the metropolitan area what they had in the rural areas. On the other hand, Ijere (1994) studies that rural-urban migration positively impacts urban growth and social development, which generates employment prospects and facilities of education, transportation, health care, and more income for the migrants.

During the last decade, Bangladesh's development is continuing faster than the previous periods. People move from one place to other places due to the job and opportunities for employment and are a dynamic process. The development of the transportation sector, communications, connectivity with rural areas, access to electricity, and gas shaped the people's livelihood. It increased the people's expectation day by day. This change turns the economic development of the society and the people in the urban area and the rural area through the remittances they send to their family members. However, the relationship between migration and development is not directly estimated and forecast. Rural-urban Migration is necessary for the development of the urban area to meet the

labor demand at the various industries and the service sectors. The rural area is benefitted through remittances, acquired knowledge, education, and awareness about health care from the urban migrated population.

Selection of the Study Area

Due to the increase of urbanization around Dhaka city, the migrated people are pushed and pulled nearby. Savar is significantly closer to Dhaka and growing faster than any other area. There is an EPZ in Savar, which is much enriched with multinational companies. More than five million people are working as garments workers; besides these occupations, there are many professional people in formal and informal sectors working and living at Savar. Moreover, heterogeneous people are living here come from various districts. Migration reasons are the main objective to know from the respondents, mostly chosen the household head. Using the data analysis, we have found the common factors for migration and assess the livelihood in Savar's urban area. They use their surplus money in the metropolitan area and the rural area through their family members.

Methodology

Many studies and research about the rural-urban migration; we have found some common factors for the migration as push or pull factors. Where life is in threatening and struggling, people leaving the place is called the push factors. Alternatively, for people where they think life is prospering, migrating is called the pull factors. We may categories these factors as:

Table 1: Reasons for Migration

| Push factors | Pull Factors |
|--|-----------------------------------|
| 1. Natural disasters | 1. Lack of space |
| 2. Food insecurity | 2. Congestion |
| 3. Disease | 3. Job and business opportunity |
| 4. Flood | 4. Higher wages and salaries |
| 5. Diseases | 5. More access to public services |
| 6. Drought | 6. Better lifestyle |
| 7. Poverty | 7. Better health care services |
| 8. Unemployment | 8. Better education |
| 9. Landlessness | 9. Family together |
| 10. Losing assets | 10. Friends and relatives |
| 11. Modernization of agriculture | |
| 12. Political reason | |
| 13. Ethical conflicts | |
| 14. Quarrel with family members and others | |
| 15. Family expansion | |
| 16. Involve in crime | |
| 17. Religious purpose | |

Prepared by Author**Factors for Migration:**

The push-pull factors are broadly categorized are I. Geographical reason II. Economic reason III. Demographical reason IV. Social cause V. Natural disaster VI. Better life in the city and VII. Political and ethnicity. These factors can be highlighted before the data analysis shortly:

I. Geographic Reason

Migrants decide to move from rural to urban with friends and relatives who have already migrated previously and create job opportunities or refer to the job for them. People first think to move the near urban place of their rural areas, and once they are used to and when they have better opportunities and chances to the city, they migrate there. Another fact is communication, which creates the choice of migration between permanently or temporarily. River erosion is one of the geographical factors to migrate from their origin to the city with other relatives or alone to manage their shelter.

II. Economic Reason

Due to the lack of job opportunities for rural labor, people migrate from an urban area to find a job and have income for their livelihood. This is the primary reason for migration from rural to urban. As the surplus labor (disguised labor in the agriculture sector) has no job in the rural area and the nearby urban area, they start to move towards Dhaka, Chattagram, Khulna, Rajshahi, and other major cities in Bangladesh.

III. Demographical Reason

There is an intensive relationship between migration and demographic factors such as age, gender, education, income, household size, marital status. Many researchers have found that young people migrate more than old-age people and unmarried people tend to migrate from one place to another. In any country, it has been observed men migrate higher than women. Another common factor in any country, higher educational institutes, universities, colleges, is urban. After completing the HSC level or equivalent education, they have to come to the urban area for a higher education level. Once they complete the university or equal education, they search for a job in the urban area and try to live in the city and bring the other family members.

IV. Social Factors

Some social factors responsible for migrations are family ties, social disturbance, family disputes, and old age shifting due to physical or mental health. The family head is bearing all the costs of aged parents, sisters, and children from the fixed income, mostly from agriculture activities. Sometimes they fail to meet all the family expenses and search for a second source of income and, lastly, migrate towards urban areas in various cities. On the

other hand, there are many social conflicts due to land partnership or ownership with relatives and the court to solve. Still, there is a lot of money spent and losing assets as the poor people are always sufferers. Lastly, they migrate towards the urban area to get a job and earn money.

V. Natural Disaster

Natural calamity is a regular fact in Bangladesh, like floods, cyclones, drought, river erosion, deforestation, fatal diseases. Every year flood destroys the crops, spoils the assets, and due to the high flood, river erosion starts and makes them homeless with their cultivable lands surrounding their house. Cyclone destroys almost everything sometimes, especially in the south part of Bangladesh. Nothing is remaining to survive, then they start to migrate towards the nearer city, and the final destination is divisional cities.

VI. Better life in the urban area

Many studies on "fly towards the light" mean people are attracted to urban areas due to better amenities and services such as education, health care, gas, electricity, and water supply entertainment. In rural areas, someone may not like and work as an agricultural worker, but they wish to use it in urban areas. Indeed, the job market in the urban area is more extensive and ready for work. Sometimes it is necessary to get a job done by their relatives, friends, and neighbors.

VII. Political Fact

The political factor is another reason for migration, due to some peoples are threatened by the opposition party. Once the government changes, then a severe political problem arises all over the country. Ruling party supporters have more power with leaders' help, have a good connection with administration and police, and try to exercise this power on the opposition supporters and create a panic. They cannot live in their residence and leave their home towards the urban area to hide with the search for a job, either formal or informal sectors.

Data Collection and Analysis

Socio-Economic Characteristics of Migrants

This study is completed as required well-designed questionnaire and collected 60 people's information randomly who are residing around Savar and migrated from various villages, semi-urban areas of the country. The main objective is to identify the reasons and living standard and other characteristics of the migrants.

Age of the Migrants

We have found most young people migrate between 16 and 30 years, about 36.67% of the total sample size. The second highest migrants' are at the age of 31 to 45 years, and the percentage is approximately 23.33. Below and more elevated than these two groups,

people are migrated with other family members' assistance. This distribution is presented as:

Table 2: Respondents' age

| Group | No. of respondents | Percent |
|----------|--------------------|---------|
| Below 15 | 04 | |
| 16-30 | 22 | |
| 31-45 | 14 | |
| 46-60 | 15 | |
| 60+ | 05 | |
| Total | 60 | |

Source: Field Survey, 2018

The average age of migrants is about 27 years, 28 years for males, and 26 years for females. The family head usually migrates first, and then the other members are joined with him (her very few cases), mostly below 15 years and more than 60 years people. Thus, we may observe migration because the most active people are migrated from rural to urban areas. Migration is the process that will not stop due to the natural facts and phenomena and the non-saturation behavior of the people.

Table 3: Gender of the Migrants

| Gender | Frequency | Percent |
|--------|-----------|---------|
| Male | 29 | 48.33 |
| Female | 31 | 51.67 |
| Total | 60 | |

Source: Field Survey, 2018

We have a sample size of 60, and about half of them are male, and half of them are female and live in the urban area miserably. Though the ratio is closer, in reality, male persons migrate more than the female. Due to the unknown environment and uncertainty at the rural area male person migrate first and comparatively they can adopt and survive. Once they have a job and good income then they bring their family to them and female are also seeking job to increase the income and meet their necessity.

Origin of Migrants

Some clusters that are from similar parts of the country are identified. A large cluster of slum people have migrated in this sample are from the north and south areas of

Bangladesh, for example. People from the same places came here through a person from the source of some individuals who live here and formed different communities based on the same roots. A large proportion of migrants arrived from Rangpur, Pabna, Jamalpur, Rajbari, Faridpur and other districts, according to the field research. People also migrated from grater southern part of Bangladesh.

Migration Trends

According to the field study, there is a dramatic connection between migration patterns and recent years. The data shows that the range of migration has been growing for the last 10 years. The trend has been a little downward in the last 1-3 years. The highest trend in migration is seen from 4-6 years ago, the migration trend is just 14 percent 7-10 years ago, where the percentage increased by more than twice (14 to 29 percent) after 5 years.

Table 4: Educational Pattern of the Migrants

| Education | Freq. | Percent |
|--------------|-------|---------|
| No education | 30 | 50.00 |
| Class 5 | 15 | 25.00 |
| Class 8 | 6 | 10.00 |
| SSC | 4 | 6.67 |
| HSC | 2 | 3.33 |
| Degree | 1 | 1.67 |
| Honors | 2 | 3.33 |
| Total | 60 | 100.00 |

Source: Field Survey, 2018

The figure indicates that 50% of migrants have no education, they do not able to read or write, but some can only sign or have no knowledge of counting. About 25% of migrants have class five level of education and about 10% of migrants have up to eight class level of education. At the same time, only 6.67% of migrants have more than a high school certificates and may be some have diploma. There is a tendency that less educated people migrate more than the educated people from different parts of the country. Only who wants the higher education they migrate towards the urban areas.

Table 5: Occupations of the respondents

| Respondent Occupation | Freq. | Percent |
|-----------------------|-------|---------|
| Housewife | 1 | 1.67 |
| Construction workers | 2 | 3.33 |
| Day labor | 3 | 5.00 |
| Helper | 1 | 1.67 |
| Housemaid | 6 | 10.00 |
| Rickshaw puller | 7 | 11.67 |
| Vegetables sellers | 2 | 3.33 |
| Fruit/Juice sellers | 4 | 6.67 |
| Garments workers | 6 | 10.00 |
| Cloth business | 8 | 13.33 |
| Electrician | 2 | 3.33 |
| Hotel workers | 1 | 1.67 |
| Constructions workers | 2 | 3.33 |
| Barber | 3 | 5.00 |
| NGO officer | 2 | 3.33 |
| Sweet seller | 3 | 5.00 |
| Laundry | 4 | 6.67 |
| Contractor | 3 | 5.00 |
| Total | 60 | 100.00 |

Source: Field Survey, 2018

Almost every person who has migrated from different parts has been seen to be engaged in various works. As there is a wide retail sector in Savar, a high percentage of total males are involved in rickshaw pulling, clothing staff and grocery store maintenance. As the cost of living in a town is too high, women often work with men in a similar way. There are some common works (working in in garments factory or as a maid) are recognized among women through field surveys. It is found that the migrants are also involve clothes business on the footpaths in front of the various super markets and other parks and crowded areas and other are working at the garments sectors.

Remittances

While in terms of living costs in Dhaka, it is undoubtedly a lower income range, but 70 percent of people agreed that they have a higher income than before migration income. A very small percentage (15 percent) felt they had no improvement in income and 8 percent felt they had better earnings before migration.

Although the migrants earn a little money, they still have to send money for their dependents to their village. Approximately 80% of migrants said they had to send cash and they had to take responsibility for their dependents living in the villages. For their

family to their daily expenses, they are transferred money to the village and in some cases paid their due load. Often, with their savings, they buy land in the village. They wish to go back to their rural life if they have a job certainty and income to provide their livings.

Reasons Why They Migrate?

Every migrant has unique reasons for taking decisions about migration. Socio-economic factors behind rural-urban migration are alluded to in this report. Some variables serve directly as controlling factors in most types of rural-urban migration. As variables, they can be categories that greatly influence the rate of migration. These variables are also seen through the analysis. The factors mainly seen are shown in the below table and graph:

Table 7: Some reasons for Migration

| Serial No. | Reasons | No. of People | Percent |
|------------|--|---------------|---------|
| 1 | No work in village | 21 | 35 |
| 2 | More income in the urban | 18 | 30 |
| 3 | Due to natural disaster | 6 | 10 |
| 4 | Avoid social problems and political threat | 7 | 11.67 |
| 5 | For better life | 5 | 8.33 |
| 6 | Education for Children | 3 | 5 |
| | Total | 60 | |

Source: Field Survey, 2018

From the above table, it is found that for better job prospects or no scope of work in villages or food shortages and other basic needs, the highest spectrum of migration typically takes place. Around 35 percent of people want to move because they have no work at home for their livelihood. Most of them are both male and female young people and some landless poor segment of people in some cases. Most of them are farm boredom or find a better chance in the city. Yet somehow, most people cannot satisfy their demands or the truth once they reach at the urban in their favor. Approximately 11.67 percent of people come to town to escape numerous social problems such as racism, fanaticism, and political instability, thereby threatening life, dominating elderly peasants, etc. It also involves cases related to land acquisition, property succession, loan repayment failure, and so on. Again, both in fourth place i.e., natural disaster and landlessness are occupied. e. g., 10% of the overall respondents. Various natural disasters such as floods, cyclones, draughts, river erosion, etc. often make their lives bleaker and so they prefer to survive migration in the region. And last but not least, about 8.33 % of people come to town for better living, better children's education, better health facilities, and city amenities, utilities, and entertainment. Some of the respondents said that they are now at the urban area as can live better than rural areas. At the rural area they don't have job and income to maintain their life as they wished. They come here only for the attraction of city life, which is better and they don't want to go back to the village.

This study therefore shows that those who were engaged at the place of origin as an agriculture labor, business and unemployed were mostly migrated because of poverty; and those who were engaged in agriculture (land owner), employment / service, or study at the place of origin were mostly migrated for job search. If the change benefited the immediate family only or the wider family, the migration decision was an individual or a collective one. They were asked, in future will they to go back to their village or not if they get better opportunity in village. More than 68 percent of people said yes because they were not happy with their current situation, more than 17 percent were confused, they said they could go back to their origin, but 15 percent responded, they wouldn't go back to the village. In their present situation, they are satisfied.

Conclusion

Migration is one of the essential factors typically correlated with higher levels of productivity and expansion that lead to rapid growth of urbanization. Migration is the source of socio-economic alteration and the consequence. It is regarded as a behavioral trait that represents the devotion to reaching the people of origin and destination. Rural-urban migration is currently becoming a widespread reality and there is little control over the situation. This research will assist planners and social scientists in the implementation and extension of rural development programs by providing an overview of the people involved in the rural-urban migration process, as well as identifying key reasons or causes of migration at the individual and household level. As this study also gives some ideas about the plans and directions for migration, more proper urban planning can be planned. People moved to urban areas because they were drawn to opportunities for livelihoods. In cities and towns, the migrant population can find diversified livelihood opportunities with different incomes. The poor rural community therefore finds migration a coping mechanism for livelihoods. Their situation in the city does not confirm to their standards. They continue to do really hard work and struggle a lot. Life is really hard here, but before a better chance and situation in the city life, they do not want to go back to their roots. There is also no option other than the need for urgent action.

This study will enable the government to understand the real situation and importance of implementation, and will help policymakers to make rural and urban development policies problem-free. In order to find out not just the causes of migration, but also the priority-based solution for rural-urban migration, more research can be carried out on this topic in a large scale.

References

- Afsar, R 2000, *Rural-Urban Migration in Bangladesh: Causes, Consequences and Challenges*, University Press Limited, Dhaka.
- BBS (Bangladesh Bureau of Statistics) 2012, *Annual Labor Force Survey 2009-10*, Ministry of Planning, Government of Bangladesh, Dhaka.
- Bhuyan, AR, Khan, H & Ahmed, SU 2001, *Rural Urban Migration and Poverty: The Case for Reverse Migration in Bangladesh*, MAP Focus Study Series 10. Centre on Integrated Development for Asia and the Pacific, Dhaka.

- Chaudhury, RH 1978, 'Determinants of and Consequences of Rural Out Migration: Evidence from Some Villages in Bangladesh', *Oriental Geographer*, vol. 22, no. 1 & 2, pp. 1-20.
- Chaudhury, RH 1980, *Urbanisation in Bangladesh*, CUS, University of Dhaka, Dhaka.
- Chaudhury, RH & Curlin, GC 1975, *Dynamics of Migration in a Rural Area of Bangladesh*, BIDS, Dhaka.
- Corden, WM, Findlay, R 1997, 'Urban Unemployment Intersectorial Capital Mobility and Development Policy', *Economica*, pp. 59-78.
- Fields, GS 1975, 'Rural-Urban Migration, Urban Unemployment and Underemployment and Job Search Activity in LDCs', *Journal of Development Economics*, vol. 2, pp. 165-188.
- Gugler, J & Flanagan, WG 1978, *Urbanization and social change in West Africa*, Cambridge University Press, New York.
- Gugler, J 1991, 'Life in a dual system revisited: urban-rural ties in Enugu, Nigeria, 1961-1987', *World Development*, vol. 19, no. 5, pp. 399-409.
- Harris, JR & Todaro, MP 1970, 'Migration, Unemployment and Development: A Two-sector Analysis', *The American Economic Review*, vol. 60, no. 1, pp. 126-38.
- Hatton, TJ & Williamson, JG 1998, *The Age of Mass Migration-Causes and Economic Impact*, Oxford University Press, Oxford.
- Herrmann, M & Svarin, D 2009, *Environmental pressures and rural-urban Migration: The Case of Bangladesh*, MPRA Paper No. 12879, <http://mpra.ub.uni-muenchen.de/12879/>
- Hossain, MZ 2001, 'Rural-Urban Migration in Bangladesh: A Micro Level Study', presented at the 21st Conference of Bangladesh Association for the Advancement of Science (BAAS), Dhaka.
- Ijere, N. J. (1994). *Gender and rural-urban migration in the Ecuadorian sierra*, Columbia University Press, Columbia.
- Ishtiaque, A & Mahmud, MS 2011, 'Migration objectives and their fulfillment: A micro study of the rural-urban migrants of the slums of Dhaka city', *Geografia: Malaysian Journal of Society and Space*, vol. 7, no. 4, pp. 24-29.
- Islam, N & Saleheen, M 2006, *Rural-Urban Linkage and Migration Issue in Bangladesh: A Secondary Literature Study*, Centre for Urban Studies.
- Islam, N (ed) 2001, *Urbanization, urban planning and development and urban governance: A reader for students*, Center for Urban Studies, Dhaka.
- Johnson, G 1971, 'The Structure of Rural-Urban Migration Models', *East Africa Economic Review*, vol. 3, no. 1, pp. 21-38.
- Kelly, AC & Williamson, JG 1984, *What Drives Third World City Growth? A Dynamic General Equilibrium Approach*, The Princeton University Press, New York.
- Mahbub, AQM 1997, *Mobility Behaviour of Working People in Bangladesh: Rural-Rural and Rural-Urban Circulation*, Urban Studies Programme, Department of Geography and Environment, University of Dhaka, Dhaka.

- Mahbub, AQM & Islam, N 1988, 'Urban Adjustment by Erosion Induced Migrants', Paper on the *Impact of Riverbank Erosion, Flood Hazard and the Problem of Population Displacement*, Dhaka, Bangladesh.
- Nazem, NI 2011, 'Urbanization in Bangladesh: Pattern and Process', paper presented at *Bangladesh Urban Forum*, 5-7 December, 2011, BUF.
- Okpara, E.E.: 'The Impact of Migration on the quality of Nigeria rural life. Nigerian Agricultural Research Management and Training Institute Seminal Series, 3: 116 (1983).
- Rokib, A & Islam, R 2009, 'Effect of Some Selected Socio-demographic Variables on Male Migrants on Bangladesh', *Current Research Journal of Economic Theory*, vol. 1, no. 1, pp. 10-14.
- Stoeckel, J, Chowdhury, AKMA & Aziz, KMA 1972, 'Out migration from a Rural Areas of Bangladesh', *Rural Society*, vol. 37, no. 2.
- Todaro, MP 1969, 'A model of labour migration and urban unemployment in less developed countries', *The American Economic Review*, vol. 59, pp. 138-148.
- Toufique, K. and Turton C. 2002, 'Hands Not Land: How Livelihoods are Changing in Rural Bangladesh', Bangladesh Institute of Development Studies, September, 2002, Dhaka.
- Ullah, AKMA 2004, 'Bright City Lights and Slums of Dhaka City: Determinants of Rural-Urban Migration in Bangladesh', *Migration Letters*, vol. 1, no. 1, pp. 26-41.
- United Nations 2009, *World Urbanization Prospect: The 2009 Revision*, Department of Economic and Social Affairs, Population Division.

Profile of the Migrants from Bangladesh: A Comparative Analysis between Current and Returnee Migrants

Md. Riad Hassan*
Mohammad Amzad Hossain**

Abstract: This paper explores and compares the profile of the current and returnee migrants who migrated from Bangladesh. The analysis is based on cross-sectional primary data collected from a nationally representative field survey conducted among 303 number of respondents of whom 194 were current migrants and 109 were returnee migrants. The findings reveal that the current Bangladeshi migrants are migrating at an earlier age than the returnee Bangladeshi migrants. Current migrants are migrating with lesser years of schooling than that of returnee migrants. The mean duration of active employment abroad is 9.06 years for current migrants and that of returnee migrants is 9.34 years. On an average, current migrants have to work longer hours daily than the returnee migrants. The dependency of rural families of Bangladesh on international migration is increasing with the passage of time. The unemployment rate among the household-heads of Bangladeshi migrants increases by 10 percentage point when one of the members of that family migrates abroad.

Keywords: Current migrant, Returnee migrant, Comparison of Profile, Bangladesh.

1. Introduction

1.1 Background and Context

International labor migration has long been a livelihood strategy throughout the globe. Bangladesh is not an exception either. Labor migration from Bangladesh has started way back in the year 1976, only within 5 years of its emergence as an independent country. Initially it was all about male-migration in some very limited middle-eastern countries. But since 1991, Bangladeshi females also started to cross the border for their livelihood. According to (Romano & Traverso, 2019), in 2011, almost one out of nine Bangladeshi households had some direct experience of international migration. Gardner (2009) argued that the impact of international migration on Bangladesh society is not only confined to economic dimension, but also contributing to shape the ideals of personal growth and self-realization of an entire generation of Bangladeshis. Historically, migration from Bangladesh has been dominated by short-term low-skilled migrants majority of whom came from the rural areas of the country. Das, de Janvry, Mahmood, and Sadoulet (2014) stated that most migrants of Bangladesh are poor rural persons who are low-skilled individuals who work on short-term contracts, and what makes potential migrants vulnerable is that they are mostly unskilled and poorly educated workers. Hossain (2001) argued that, generally, the differentials in migration (selectivity of certain person or group to be more mobile than others) have been studied mainly by age, sex, marital status, education and occupation. Several studies reported that determinants of migration vary from country to country and even within a country and it varies depending on the socio-economic, demographic and cultural factors.

* Associate Professor, Department of Accounting & Information Systems, Jatiya Kabi Kazi Nazrul Islam University, Trishal, Mymensingh, and UGC Ph.D Fellow, Department of Economics, Jahangirnagar University, Savar, Dhaka, E-mail: mddipto@gmail.com

** Professor, Department of Economics, Jahangirnagar University, Savar, Dhaka
E-mail: amzad104@juniv.edu

Bangladesh has been sending labor abroad for more than 43 years. Over the period, the structure, and complexion of labor migration from Bangladesh has changed and it still is changing. In the backdrop of intense global competition in the overseas labor-markets, sending the right person at the right age to the right country with appropriate level of education and technical know-how has become a strategic policy-issue. Sarker (2017) doubted that the migration flows are likely to become more complex, ambiguous and competitive in the years to come. Merely sending anybody and everybody beyond the boundary can neither be an indicator of success nor a sign of sustainable development solution any more. But most of the existing literature concentrated on macro-level issues of migration from Bangladesh with special focus on remittance. Researchers have preferred on calculating ratios and trends of migration from and remittance inflow into the country. But unfortunately, the ultimate success of this sector thoroughly depends on knowing the macro-level demographic conditions of our migrants and devising the country's migration-policies accordingly. With this end in view, this research article has been conducted to shed light on the demographic conditions of the Bangladeshi migrants and also their left-behind families, and also to compare those between current and returnee Bangladeshi migrants.

1.2 Objectives

1. To explore the profiles of current and returnee migrants of Bangladesh
2. To identify the profiles of the households of Bangladeshi migrants
3. To compare the profiles between current and returnee Bangladeshi migrants
4. To propose some policy recommendations.

2. Literature Review

Mallick (2019) argues that the decision to migrate or not to migrate can be either deliberate or involuntary, and hence, a generalized reasoning is difficult to reach. Zeitlyn (2007) stated that migration from Bangladesh to the Middle East and Asia is mostly tied to unemployment and poverty. Ryan, Sales, Tilki, and Siara (2008) stated that social networks also dictates the course of migration decisions.

Hassan and Jebin (2018) mentioned that the average age of past Bangladeshi migrants is 30.9 years and that of current migrants is 32.13 years. Kuhn, Barham, Razzaque, and Turner (2020) in a cross-sectional study conducted in Bangladesh, found that current international migrants were younger (mean 32.9 years versus 35.8 years), had more schooling (7.6 years versus 5.8 years), and were more likely to have an international migrant father (9.7% versus 4.0%) or brother (49.1% versus 30.3%). Rahman (2018) mentioned that among the surveyed Bangladeshi migrants entrepreneurs in Saudi Arabia, 36% were in their thirties and 58% were in their forties. Morad and Gombač (2018) surveyed 100 Bangladeshi migrants in 2 Italian cities namely Padova and Cadoneghe and found that over 50 percent of the respondents were young, most of them between the ages of 18 and 35. Only eight percent of the respondents were over 50 years old. The mean age was 35, the youngest being 20 and the oldest being 58 years of age.

In the case of migration to the Middle East, (Osmani, 1986) reveals that 83 percent of Bangladeshi migrants had not finished secondary school. Gardner (1995) mentioned that the first-generation migrants from Bangladesh to the UK were mostly illiterate, and those who migrated later also had no or lower levels of formal education. Rahman (2010) found that only 7 percent of Bangladeshi workers in Singapore had university degrees. Morad and Gombač (2018) found that 25 of their respondents had graduated or held postgraduate degrees even before migrating to Italy and 54 percent of had secondary-level education (college or high school certificates). Rahman (2018) in his survey among the Bangladeshi migrants entrepreneurs in Saudi Arabia found that they had different levels of educational qualifications: 66% had from 6 to 12 years of schooling in Bangladesh, and 18% had from 13 to 16 years of schooling. Das, de Janvry, and Sadoulet (2015) found that migrants from Bangladesh had, on an average, 6 years of education. On the other hand, (Hassan & Jebin, 2018) stated that the average years of schooling of past Bangladeshi migrants is 5.32 years and that of current migrants is 6.67 years. Kuhn et al. (2020) mentioned that current international migrants had higher levels of schooling than non-migrants (mean 7.6 versus 5.8 years), but they were similar to internal migrants (mean 7.9 years). They also found that international migrants had significantly higher levels of mother's and father's schooling relative to non-migrants, though significantly lower than those of internal migrants. International migrants were much more likely to have a father who had lived abroad or a brother who had lived abroad.

Morad and Gombač (2018) found that most of the Bangladeshi migrants who came to Italy in the 1990s were from the upper middle class. Della Puppa (2013) mentioned, on the other hand, that they mostly came from families of landowners, entrepreneurs, lawyers, teachers, civil servants, military officers, and managers. Romano and Traverso (2019) found that only a tiny share of international migrants originates from households belonging to the lowest expenditure quintile. Kuhn et al. (2020) also found that both current and returned international migrants came from households whose 1996–1997 household assets were about 30% higher than those of both non-migrant and internal migrant households. Zeitlyn (2006) found that in the case of the first generation of Bangladeshi migrants in the UK, the majority of them had rural agricultural backgrounds. However, they found 'stepping down' in the occupations and activities of Bangladeshi migrants in Madrid compared to their situation in Bangladesh. They stated that they "were running their own business in their country of origin, but they are working now for someone else as manual laborers". International migration helped rural households to innovate farming technology (Mendola, 2008) and enhance household resilience to shocks (Sikder & Higgins, 2017).

According to (Abusharaf, 1997; Singh & Yadava, 1981), adult males are more inclined to migrate than other people of the community. Coleman, Compton, and Salt (2002) mentioned that almost all Bangladeshis and Pakistanis are Muslim, most Indians are Hindu or Sikh, a few are Christians, and unlike the indigenous population, men still outnumber women among Bangladeshis. They also found that immigrant women from Bangladesh and Pakistan have the lowest levels of literacy among the UK immigrants. Morad and Gombač (2018) mentioned that the majority of the respondents in their survey were male (89 respondents) and married (83 respondents). However, (Joarder & Miller, 2013) found that females are more inclined to migrate temporarily. Hassan and Jebin (2018) found that the average duration of migration of Bangladeshi migrants abroad is 4.84 years.

Islam (2007) found that 50% of migrants from Bangladesh were unskilled, 16% semi-skilled, and the rest were skilled or professionals. Das et al. (2015) found that among migrants from Bangladesh, 67% had no experience in skilled work, and 22% were unemployed in their home country. Rajan (2018) found it evident that majority of non-nationals in GCC countries were confined to blue-collar jobs, but this is now changing, leading to brain drain from those countries. Wang (2018) argued that low-skilled migrant workers are often directed into foreign labor markets through middleman facilitated trade.

Rahman (2015) reports that Bangladeshi migration to the GCC countries is basically debt-driven, and the lenders of the funds for migration actually siphon off a significant chunk of migration (economic) returns. Migrant families are forced to exploit valuable family resources in order to provide for the economic cost of migration, which, in turn, transfers labor migration into debt migration. Hassan and Jebin (2018) found that migrant households had significantly high level of outstanding debt, of which 35% is directly caused by the international migration. However, (Sharma & Zaman, 2009) have reiterated that remittance-receiving households are more creditworthy. Hadi (2001) finds that household capabilities and functionings are improving with the prevalence of migrant member(s).

Joarder and Hasanuzzaman (2008) found that compared with the permanent migrants, temporary migrants' educational status, per capita income allocation to family members, work experience before migration, source of income and income range are much lower. But, the dependency ratio, contribution to the family, remittances, risk etc. are higher for the permanent migrants than the temporary migrants. Cost of migration and the migration decision are inversely related. Migration costs determine individual's decision to migrate permanently or temporarily. Using multivariate models, (Graham & Jordan, 2011) showed that children of migrant fathers in Indonesia and Thailand are more likely to have poor psychological well-being, compared to children in non-migrant households. This finding was not replicated for the Philippines or Vietnam though.

According to (BMET, 2019), at present, the number of destination countries for Bangladeshi migrants has touched 168 globally. But most of the previous studies focused on Bangladeshi migrants in some specific countries and tried to explore their socio-economic and demographic profiles. Zeitlyn (2006) found that most of the Bangladeshi migrants in the UK originated from the Sylhet region with similar background. So, studying Bangladeshi migrants in a single foreign county is expected to produce results that may be similar among those migrants which may very much be in divergence with the profile of the migrants of entire Bangladesh. What it does suggest is that studying Bangladeshi migrants in a single country can only give a partial finding regarding the profile of migrants and hence cannot be generalized for the migrants of the entire country. Thus, most of the similar previous studies failed to address the diversity of migrants' profile of Bangladesh. This article has been devised to address this research gap.

3. Methodology

3.1 Data Collection

This is thoroughly a primary data-based micro-level study. To fulfill the objectives, cross-sectional data have been resorted to. Relevant data have been collected from a

field-survey conducted through personal interview. For this, a well-formulated questionnaire was developed. The data collection period was from December 2018 to February 2019. Data have been collected by the author and 5 trained interviewers.

3.2 Sampling Design

In order to fulfill the objectives, nationally representative data were required. And in order to fill the research gap, the survey was needed to be conducted among Bangladeshi migrants in different countries of the world. Morad and Gombač (2018) surveyed 100 Bangladeshi migrants and found that among the 100 participants in their survey, only 20 migrants originated from urban areas of the country. It implies that most of the Bangladeshi migrants originate from rural areas of Bangladesh. Hence, the sample for this study was chosen predominantly from union level of Bangladesh. The survey was conducted in four divisions namely Chattogram, Dhaka, Mymensingh and Khulna. At first, 2 districts of Chattogram, 2 districts of Dhaka, 1 district of Mymensingh and 1 district of Khulna division with the highest migrant concentration were chosen according to (BMET, 2019). Then 15 unions were selected under 7 upazilas of those 6 districts. Since the highest migrant concentration of the country is found in Chattogram division, 10 unions from the selected 2 districts were covered from this division for the survey. Apart from that, 2 unions were covered from the selected 2 districts of Dhaka division, 1 union was covered from the selected 1 district of Mymensingh division and 1 union was covered from the selected 1 district of Khulna division. The unions were selected based on convenience. Then snow-ball sampling technique was resorted since official database of Bangladeshi migrants is still unavailable.

3.3 Sample-size Selection

Since our population is a infinite one, sample size calculation formula for infinite population was used. According to that calculation, our sample size came out as 196. But due to availability of the respondents, we conducted the survey based on a sample size of 303. Among them, 194 were current migrants and 109 were returnee migrants, and they migrated in 21 different countries of the world.

3.4 Criteria of Selecting Sampling Respondents

Our sample respondents were either the returnee migrant or the household-head of the current migrant. Migrants who have been residing abroad for at least 1 year for the sole purpose of earning incomes and household-heads of such migrants were chosen for the survey. A returnee migrant meant a Bangladeshi migrant who resided abroad for at least 1 year for the purpose of earning incomes and then returned to Bangladesh and is currently residing here. A current migrant meant a Bangladeshi migrant who is currently residing abroad for at least 1 year for the purpose of earning incomes or is currently residing in Bangladesh due to vacation purpose, and have spent at least 1 year abroad for the purpose of earning incomes.

4. Findings

4.1 Profiles of the Migrants

4.1.1 Current and Returnee Migrants by Actual Age during First Migration

The actual age of the migrants plays a vital role in getting jobs abroad. Though any of the working-age population can be accepted by destination country as a foreign worker, countries may have preferences about workers falling in some specific age categories. Similarly younger workers may have higher desire to migrate than the older ones. However, the actual age of migrants during their first migration may be guided both by the socio-economic conditions of the migrants and also by the nature of jobs for which foreign employers are looking for migrant workers. Following table 4.1 and figure 4.1 show the actual scenario for Bangladeshi migrants in terms of their actual age during first migration based on the survey result:

Table 4.1: Actual Age of the Migrants during First Migration

| Actual Age of the Migrants During First Migration (in years) | Types of Migrants (%) | |
|--|-------------------------------|--------------------------------|
| | Current Migrants ¹ | Returnee Migrants ² |
| Less than 15 | 0.5 | 0 |
| 15-24 | 60.8 | 49.5 |
| 25-34 | 28.8 | 35.9 |
| 35-44 | 7.6 | 9.1 |
| 45-49 | 0.5 | 3.7 |
| 50 and above | 1.5 | 1.8 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Age of Migrants During First Migration (in years) | 25.12 years | 26.84 years |
| Standard Deviation | 7.19781 | 7.99794 |
| Minimum value | 14 years | 15 years |
| Maximum value | 54 years | 54 years |

Source: Field Survey, December 2018-February 2019

¹ A current migrant meant a Bangladeshi migrant who is currently residing abroad for at least 1 year for the purpose of earning incomes or is currently residing in Bangladesh due to vacation purpose, and have spent at least 1 year abroad for the purpose of earning incomes.

² A returnee migrant meant a Bangladeshi migrant who resided abroad for at least 1 year for the purpose of earning incomes and then returned to Bangladesh and is currently residing here.

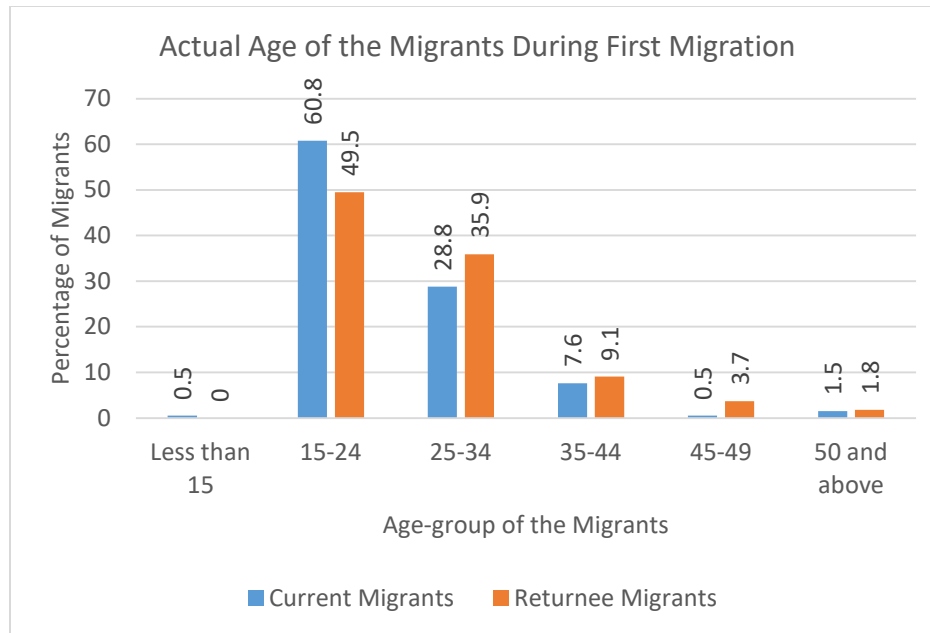


Figure 4.1: Actual Age of the Migrants during First Migration

Source: Field Survey, December 2018-February 2019

Table 4.1 and figure 4.1 reveal that almost 61 percent of the current Bangladeshi migrants first migrate during the ages between 15 to 24 years followed by almost 29 percent during the ages between 25 to 34 years. It is also found that 0.5 percent of the current Bangladeshi migrants migrate even before the age of 15 years. However, the rate of migration above the age level of 34 years gradually decreases and it becomes very small after 44 years.

For returnee Bangladeshi migrants, the scenario is similar. Almost 50 percent of them first migrate during the ages between 15 to 24 years followed by almost 36 percent during the ages between 25 to 34 years. The percentage decreases above the age level of 34 years gradually decreases and it becomes miniscule after 44 years.

The mean age during first migration for returnee Bangladeshi migrants is almost 27 years which is 25 years in case of current Bangladeshi migrants. It reveals that with the passage of time, younger people have the tendency to migrate from Bangladesh. However, the minimum age of first migration for current migrant is 14 years and that of returnee migrant is 15 years.

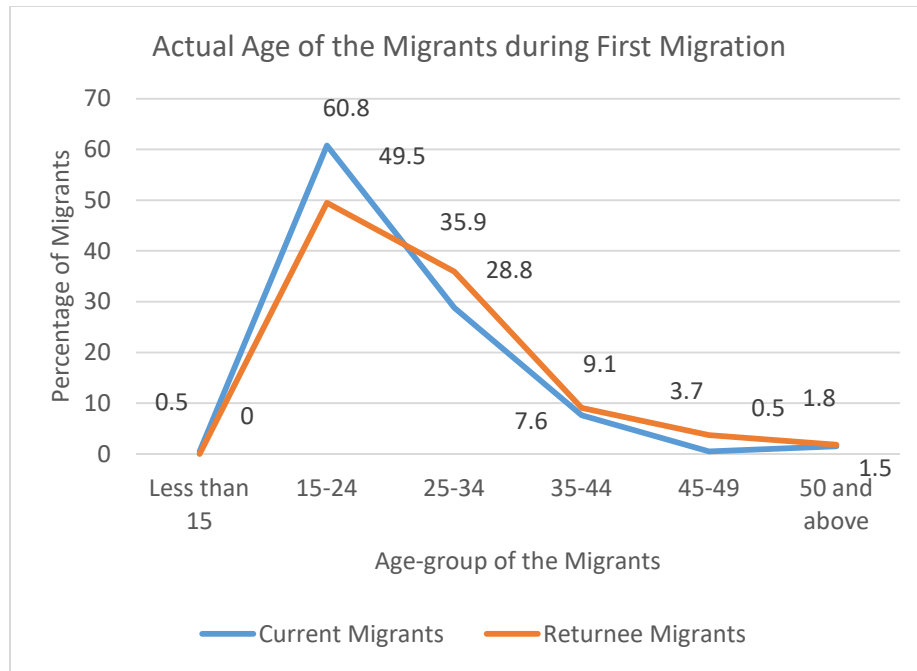


Figure 4.2: Comparison of Actual Age during First Migration of Current and Returnee Migrants

Source: Field Survey, December 2018-February 2019

Figure 4.2 shows that the tendency to migrate at earlier ages is higher among current Bangladeshi migrants than among returnee Bangladeshi migrants. Almost 61 percent of current migrants compared to almost 50 percent of returnee migrants migrate during the ages between 15 to 24 years. However, for the age group of 25-34 years, the scenario reverses. Almost 36 percent of returnee migrants compared to almost 29 percent of current migrants migrate during this age group.

4.1.2 Current and Returnee Migrants by Education Level

Educational background of the migrants plays a key role in fetching unskilled or skilled jobs abroad. Generally speaking, the higher the years of schooling, the higher is the possibility of getting better paid jobs and vice versa. However, the quality of education in the home country also matters for the foreign employers. If it fails to match their requirements, educational background may become irrelevant in getting better jobs abroad. At the same time, if the migrants find that the quality of education in their home country does not matter much to the foreign employers, they may opt for leaving their education incomplete in the home country and go for migration at an earlier age than preferred. Following table 4.2 and figure 4.3 show the actual scenario for Bangladeshi migrants in terms of their years of schooling in Bangladesh before migrating abroad based on the survey result:

Table 4.2: Educational Background of the Migrants

| Educational Background (Years of Schooling) | Migrants by Levels of Education (%) | |
|--|-------------------------------------|-------------------|
| | Current Migrants | Returnee Migrants |
| 0 | 3.6 | 4.6 |
| 1-5 | 26.3 | 22.9 |
| 6-8 | 29.4 | 34 |
| 9-10 | 28.4 | 22 |
| 11-12 | 8.7 | 10.1 |
| 13-16 | 3.5 | 4.5 |
| 17 and above | 0 | 1.8 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Years of Schooling | 7.72 years | 7.86 years |
| Standard Deviation | 3.12553 | 3.52890 |
| Minimum value | 0 year | 0 year |
| Maximum value | 16 years | 17 years |

Source: Field Survey, December 2018-February 2019

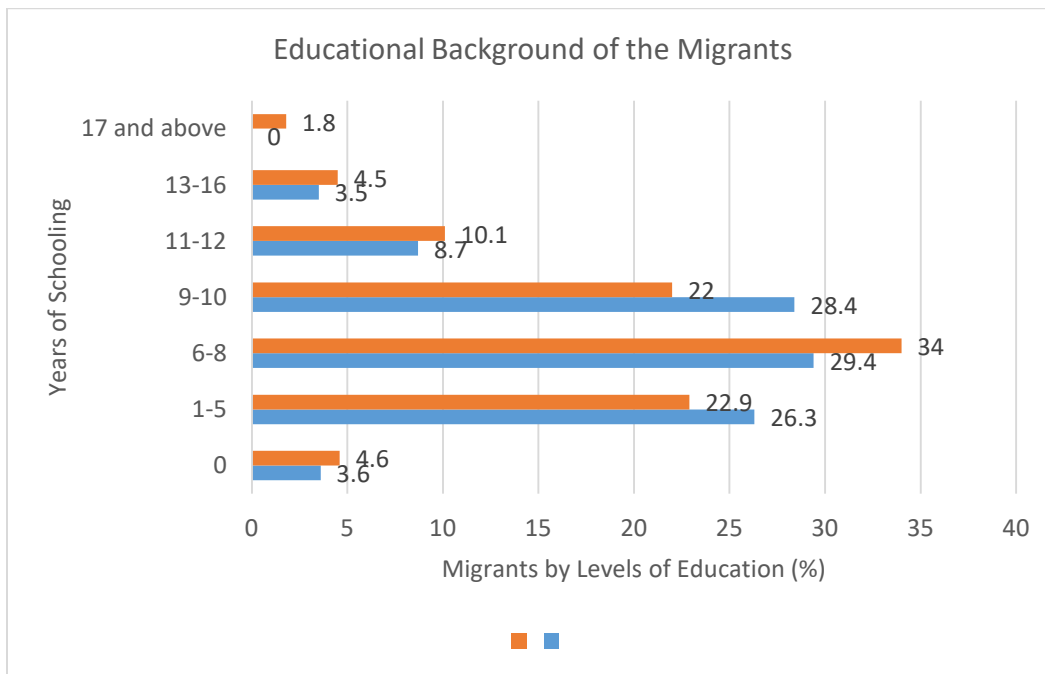


Figure 4.3: Educational Background of the Migrants

Source: Field Survey, December 2018-February 2019

Regarding the educational background of the migrants as computed by their years of schooling in Bangladesh before migration, similar scenario has been observed among current and returnee migrants. The survey result reveals that 34 percent of the returnee Bangladeshi migrants migrate with 6-8 years of schooling. Figure 4.3 demonstrates that the maximum portion of the returnee migrants leave the country without even completing their Secondary School Certificate (SSC) examination. Similarly, it has been observed that almost 30 percent of the current Bangladeshi migrants migrate with 6-8 years of schooling implying that the maximum portion of the current migrants leave the country without completing their Secondary School Certificate (SSC) examination. Almost 23 percent of returnee migrants and more than 26 percent of current migrants leave the country only with primary-level education. In total, around 84 percent of the returnee migrants and 88 percent of the current migrants of Bangladesh migrate without completing their tertiary-level education. The scenario seems ominous as higher percentage of current migrants are leaving the country with incomplete tertiary-level education. This is one of the reasons why most of the Bangladeshi migrants get lower wages compared to their foreign counterparts abroad for the same job. Another startling finding is that around 5 percent of returnee migrants and 4 percent of current migrants migrate with barely any education. Only 6 percent of returnee migrants and 3.5 percent of current migrants get university-level education before they move abroad. The mean years of schooling for returnee Bangladeshi migrants is 7.86 years whereas it is 7.72 years in case of current Bangladeshi migrants. The highest years of schooling is 17 years in case of returnee migrants and 16 years for current migrants. The lowest years of schooling is 0 year for both types of migrants. It implies that there are Bangladeshi migrants who migrate with hardly any education whatsoever.

4.1.3 Current and Returnee Migrants by Number of Times Migrated

Many migrant workers migrate for more than once with new job contracts. It has significant implication especially on their cost of migration. Cost of migration increases when people migrate to perform a new job in a new country or in the same country but in a new organization. Apart from that, those who migrate in different countries have to face the extra challenge of coping with new language, culture, working condition, after all, new environment. Most of the Bangladeshi migrants perform contractual jobs abroad in which their wages remain fixed for the entire contract period and their designations do not change. If they migrate for a second or third time with new job in a new organization of the same country or in a different country, they have to start afresh as a contractual worker and again their wages and designation remain fixed for a stipulated contract period. In the process, they may encounter lack of growth in their foreign career. Following table 4.3 and figure 4.4 show the actual scenario for Bangladeshi migrants regarding the number of times they migrated abroad with independent job-contract based on the survey result:

Table 4.3: Number of Times Migrated with Independent Job-contract

| Number of Times Migrated with Independent Job-contract | Types of Migrants (%) | |
|--|-----------------------|-------------------|
| | Current Migrants | Returnee Migrants |
| 1 time | 77.3 | 76.1 |
| 2 times | 14.4 | 18.3 |
| 3 times | 5.7 | 3.7 |
| More than 3 times | 2.5 | 1.8 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Number of Times Migrated | 1.43 | 1.33 |
| Standard Deviation | 1.23735 | 0.72079 |
| Minimum value | 1 time | 1 time |
| Maximum value | 12 times | 5 times |

Source: Field Survey, December 2018-February 2019

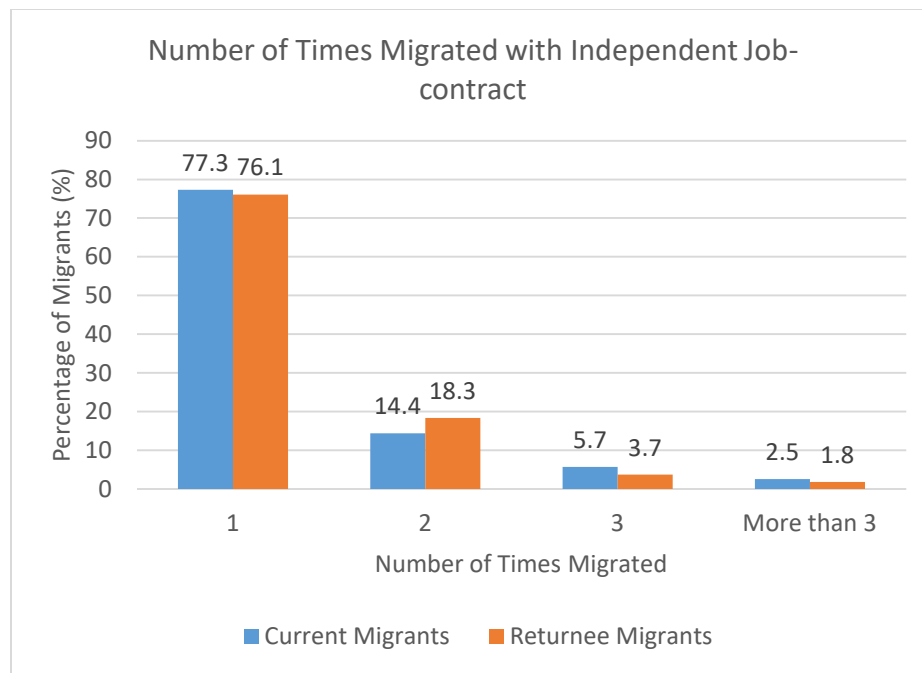


Figure 4.4: Number of Times Migrated with Independent Job-contract

Source: Field Survey, December 2018-February 2019

Total number of times a migrant migrates with independent job-contract changes the cost of migration. According to the survey result, table 4.3 and figure 4.4 show that 77 percent of current Bangladeshi migrants and 76 percent of returnee Bangladeshi migrants have

migrated for only one time. However, a little more than 14 percent of the current migrants and 18 percent of the returnee migrants have migrated for two times with separate jobs abroad. The mean number of times a migrant migrate abroad with independent job contract is 1.43 times for current migrants and 1.33 times for returnee migrants. The maximum number of times of migration is 12 times for current migrants and 5 times for returnee migrants. Minimum number of times of migration is 1 time for both types of migrants.

4.1.4 Current and Returnee Migrants by Total Duration of Active Employment

Migrants' earnings abroad do not depend on their total duration of overseas stay, rather depend on total duration of their active employment in the host-countries. Hence it is important to focus on the total duration of active employment of Bangladeshi migrants abroad. It is important for another reason as well. Most of the Bangladeshi migrants perform contractual jobs abroad during which their wages and fringe benefits remain unchanged, and usually the contract period is between 3 to 5 years. Following table 4.4 and figure 4.5 show the actual scenario for Bangladeshi migrants in terms of their total duration of active employment abroad based on the survey result:

Table 4.4: Total Duration of Active Employment

| Total Duration of Active Employment (in years) | Types of Migrants (%) | |
|---|-----------------------|-------------------|
| | Current Migrants | Returnee Migrants |
| 0 | 0 | 2.8 |
| 1-5 | 36.6 | 33.9 |
| 6-10 | 31.4 | 26.6 |
| 11-15 | 15.4 | 17.3 |
| 16-20 | 8.8 | 12.8 |
| More than 20 | 7.7 | 6.4 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Duration of Active Employment (in years) | 9.06 | 9.34 |
| Standard Deviation | 7.36120 | 7.74707 |
| Minimum value | 1 year | 0 year |
| Maximum value | 40 years | 38 years |

Source: Field Survey, December 2018-February 2019

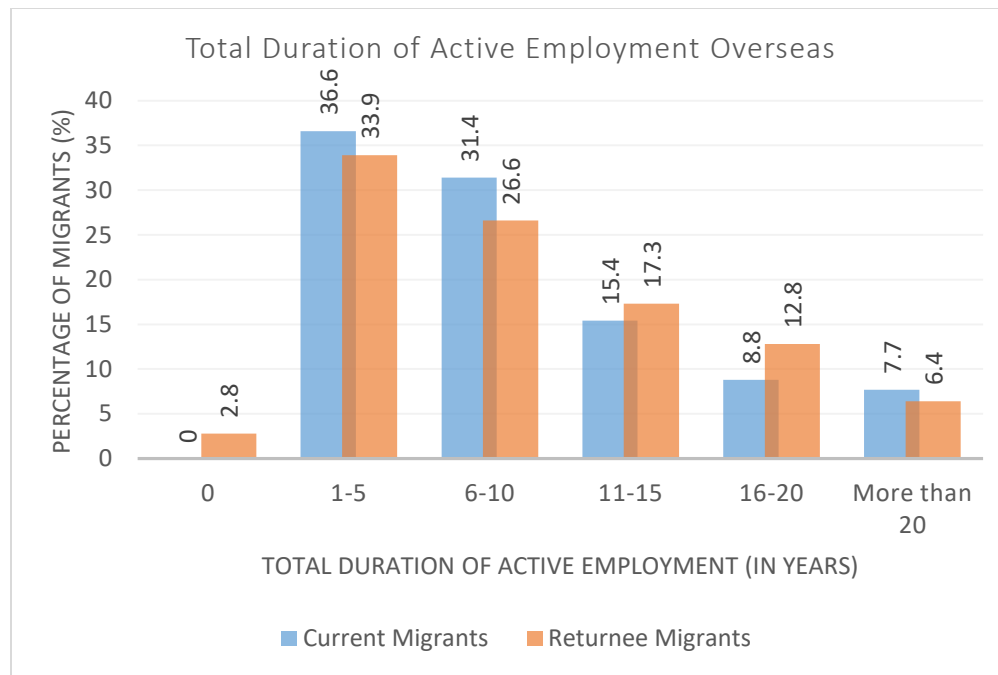


Figure 4.5: Comparison of Duration of Active Overseas Employment of Current and Returnee Migrants

Source: Field Survey, December 2018-February 2019

According to the survey results, table 4.4 and figure 4.5 reveal that around 37 percent of current Bangladeshi migrants and 34 percent of returnee Bangladeshi migrants get 1-5 years of active overseas employment. These figures are the highest among respective groups of migrants. In case of returnee migrants, it has been observed that around 3 percent of them get less than 1 year of active employment abroad. The mean duration of active overseas employment for current migrants is 9.06 years and for returnee migrants is 9.34 years. The maximum number of years is 40 for current migrants and 38 for returnee migrants. The minimum value is 1 year for current migrants and 0 year for returnee migrants. It implies that some Bangladeshi migrants remain unemployed even in foreign countries though their prime reason for migration abroad is their unemployment within Bangladesh.

4.1.5 Current and Returnee Migrants by Working Hours of the Migrants

Wage-earnings may depend on the working-hours of the migrants in overseas jobs. It is especially true in case of part-time or contractual jobs. Since most of the Bangladeshi migrants perform such kinds of jobs abroad, focusing on their average daily working hours there is of great importance to learn the pros and cons of their earnings abroad. Following table 4.5 and figure 4.6 show the actual scenario for Bangladeshi migrants in terms of their average daily working hours abroad based on the survey result:

Table 4.5: Average Daily Working Hours of the Migrants

| Range of Working Hours of the Migrants | Types of Migrants (%) | |
|--|-----------------------|-------------------|
| | Current Migrants | Returnee Migrants |
| 0 | 0 | 2.8 |
| 8 | 20.6 | 20.2 |
| 9-11 | 26.3 | 27.5 |
| 12-15 | 46.3 | 43.1 |
| 16 and above | 6.6 | 6.4 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Average Daily Working Hour | 11.11 Hours | 10.81 Hours |
| Standard Deviation | 2.31941 | 2.98814 |
| Minimum value | 8 Hours | 0 Hour |
| Maximum value | 18 Hours | 18 Hours |

Source: Field Survey, December 2018-February 2019

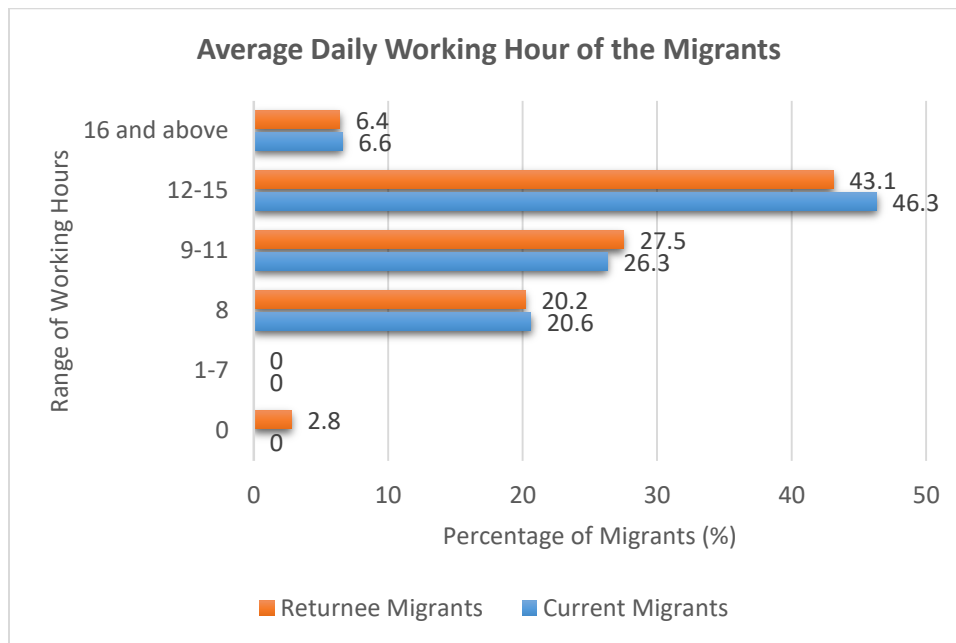


Figure 4.6: Comparison of Average Daily Working Hour of Current and Returnee Migrants

Source: Field Survey, December 2018-February 2019

Table 4.5 and figure 4.6 show that the highest chunk of returnee migrants (43.1 percent) and current migrants (46.3 percent), on an average, work for 12 to 15 hours daily in their overseas jobs. Moreover, approximately 7 percent of returnee migrants and current migrants work for 16 hours and more every day. On the other hand, almost none is found to work for less than 8 hours daily. It implies that, every Bangladeshi migrant in overseas job must have to work for at least 8 hours daily.

The mean average daily working hour for current and returnee Bangladeshi migrants are 11.11 hours and 10.81 hours respectively. The minimum value is 8 hours for current migrants and zero hour for returnee migrants. However, the maximum average daily working hours for both current and returnee migrants is 18 hours.

4.2 Profiles of the Households of the Migrants

4.2.1 Number of Family-members in the Households of the Migrants

As the number of family-members in the migrant's household increases, there is the possibility of increase of number of dependents on the migrants. Hence, the number of family-members in the household acts as a determinant of migration decision for a migrant, at least indirectly. Following table 4.6 and figure 4.7 show the actual scenario for Bangladeshi migrants in terms of their average daily working hours abroad based on the survey result:

Table 4.6: Number of Family-members in the Household

| Number of Family-members in the Household | Types of Migrants (%) | |
|---|-----------------------|-------------------|
| | Current Migrants | Returnee Migrants |
| 0 | 0 | 0 |
| 1-5 | 79.4 | 78 |
| 6-10 | 17 | 20.2 |
| 11 and above | 3.5 | 1.8 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Number of Family-members | 4.6134 | 4.3486 |
| Standard Deviation | 2.34356 | 2.16614 |
| Minimum value | 1 person | 1 person |
| Maximum value | 15 persons | 13 persons |

Source: Field Survey, December 2018-February 2019

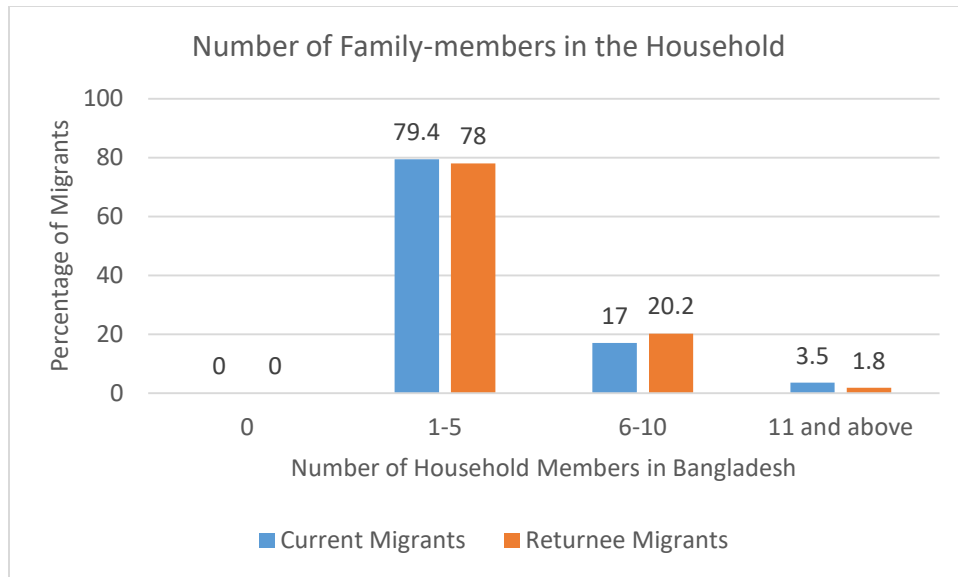


Figure 4.7: Comparison of Number of Family-members in the Household of Current and Returnee Migrants

Source: Field Survey, December 2018-February 2019

Table 4.6 and figure 4.7 show that almost 80 percent of current migrants and 78 percent of returnee migrants have number of family-members between 1 to 5. 17 percent of current and 20.2 percent of returnee migrants have number of family-members between 6 to 10. Even 11 and more number of family-members are found in 3.5 percent of current and 1.8 percent of returnee migrants' families. However, in no case zero family-member has been found implying that member of a single-member family seldom migrates. Here, family included the extended family who reside in the same household.

4.2.2 Number of Dependents in the Households of the Migrants

Number of dependents on the migrant can directly influence the migration decision. It is particularly true for those migrants who are left with no option in the home country to manage ends meet. It is expected that as the number of dependents in the migrant's family increases, the impetus of the migrant to migrate also increases. Hence, number of dependents in the family of the migrant can be considered as a strong determinant of migration. Following table 4.7 and figure 4.8 show the actual scenario for the households of Bangladeshi migrants in terms of their number of dependent members based on the survey result:

Table 4.7: Number of Dependents in the Household of the Migrants

| Number of Dependents in the Household | Types of Migrants (%) | |
|---------------------------------------|-----------------------|-------------------|
| | Current Migrants | Returnee Migrants |
| 0 | 2.1 | 0.9 |
| 1-5 | 85 | 79.8 |
| 6-10 | 9.8 | 19.2 |
| 11 and above | 3 | 0 |
| Total | 100% | 100% |
| Total Number of Observations | 194 | 109 |
| Mean Number of Dependents | 4.0464 | 3.9358 |
| Standard Deviation | 2.19111 | 1.82714 |
| Minimum value | 0 person | 0 person |
| Maximum value | 15 persons | 10 persons |

Source: Field Survey, December 2018-February 2019

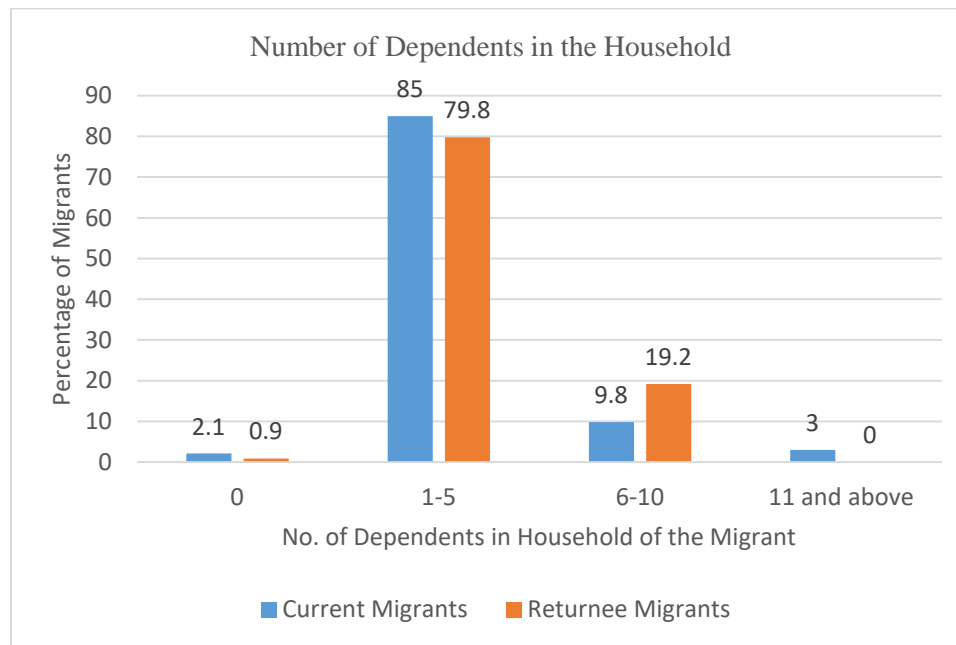


Figure 4.8: Comparison of Number of Dependents in the Household of Current and Returnee Migrants

Source: Field Survey, December 2018-February 2019

The survey results reveal that in 85 percent cases, number of dependents in the household of current migrant were between 1 and 5. And for returnee migrants, it is true for almost 80 percent households. However, in 2.1 percent households of current migrants, there

was no dependent member and in almost 1 percent household of returnee migrants, there was no dependent member. It can also be observed that in almost 10 percent household of current migrants and a little more than 19 percent household of returnee migrants have 6 to 10 number of dependent members.

4.2.3 Number of Family-members of the Migrants Working Abroad

The number of family-members of a migrant's family working abroad can have direct positive impact on the household income of the migrant. It also can show the fascination of the members of a migrant's family towards migration. Moreover, this study can also answer the question as to whether migration of the first migrant member of a family motivates the other members to migrate as well. Following figure 4.9 shows the actual scenario for the households of Bangladeshi migrants regarding their number of family-members migrating to work abroad based on the survey result:

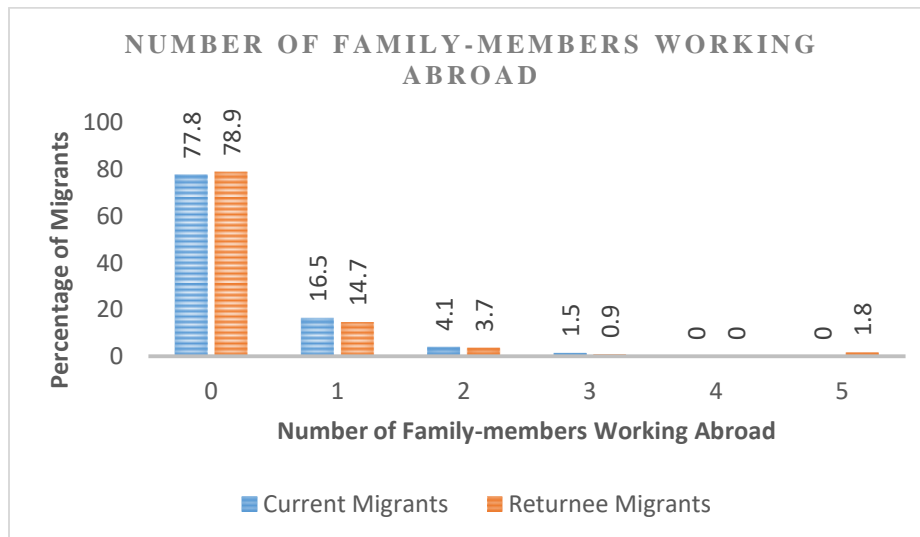


Figure 4.9: Number of Family-members of the Migrants Working Abroad

Source: Field Survey, December 2018-February 2019

According to the survey, figure 4.9 shows that the first migrant-member is the only migrant family-member in almost 78 percent of current migrant families and 79 percent of returnee migrant families. No other member migrates after the migration of the first migrant-member of the family in such cases. Though there is a wide-spread belief that an already-migrant family-member motivates subsequent migration of other members of the same family, empirical evidence in Bangladesh indicates on the contrary to this popular belief. Only 16 percent of current migrant families and 15 percent of returnee migrant families have 2 migrant-members. More than 2 migrant family-members are seldom found. What it also suggests is that previous migration of a family-member hardly can motivate subsequent migration of any other family-member of the same family. However, exception may be found in some specific areas of the country such as Sylhet. But it may not be generalized in other parts of the country as documented by the survey findings.

4.2.4 Employment Status of the Household-heads of the Migrants

Previous literature indicate that there is a tendency of the working household-heads of the migrants to leave their job/work once someone of the family migrates abroad. One possible reason is that once a family-member starts working abroad, leisure becomes more preferable for the household-heads back home. Another reason is the reluctance on the part of the household-heads of the migrant to work anymore since one family-member has already started working abroad and earning for the family. Following figure 4.10 and figure 4.11 show the actual scenario for the household-heads of Bangladeshi migrants regarding their employment status before and after migration of any family-member abroad based on the survey result:

Was the left-behind household-head employed before migration?

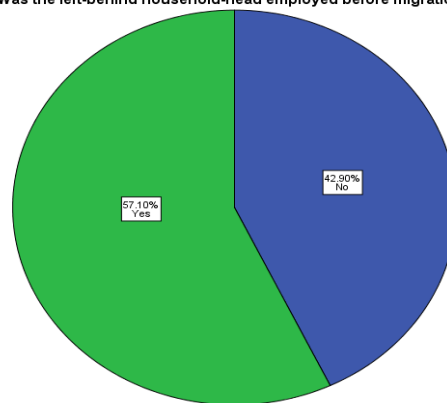


Figure 4.10: Employment Status of the Household-heads of the Migrants before Migration

Source: Field Survey, December 2018-February 2019

Is/Was the left-behind household-head employed during migration?

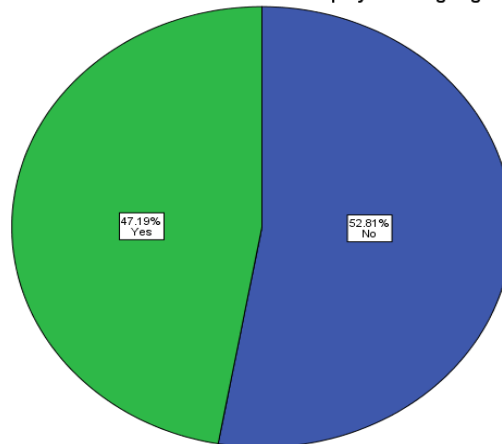


Figure 4.11: Employment Status of the Household-heads of the Migrants after Migration

Source: Field Survey, December 2018-February 2019

According to figure 4.10 and 4.11, the survey findings justify such tendency in Bangladesh as well. The figures show that before migration of a family-member, more than 57 percent of the household-heads were employed and were earning for the family. But once a family-member migrates abroad, only 47 percent of the household-heads remain employed. So, there is a 10 percentage point decrease in the employment status of the household-heads due to migration of the family-members. Though more than 50 percent household-heads remain employed before migration of a family-member, more than 50 percent household-heads become unemployed after migration of a family-member. They start depending on the earnings of the migrant-member then.

5. Conclusion and Policy Recommendations

For a lower middle-income and soon to graduate Least Developed Country (LDC) country like Bangladesh, international labor migration remain a strategic policy issue. With the ever-increasing competitiveness in the global labor market, sending the right person at the right age in the right country with appropriate education and technical know-how is the key to success. As the findings suggest, current Bangladeshi migrants are migrating even at a lower age than the previous ones. They are very often migrating with lesser years of schooling as well. Consequently they have to work longer hours abroad at lower wage rates. In most of the migrant-families, only one family-member migrates abroad. At the same time, more number of family-members depend on current migrants than that of returnee migrants. It implies that the dependency of rural families of Bangladesh on international migration is increasing with the passage of time. Another interesting finding is that more number of household-heads of the migrants want to remain unemployed when a member of the family migrates abroad. In the backdrop of these findings, the following points can be recommended:

1. Bangladeshi migrants should be permitted to migrate at least after completion of their 12 years schooling.
2. Stepping into shoes of the foreign employers, our migrants should be trained well according to their requirements before permitting them to migrate.
3. In order to decrease the dependency ratio of family-members on the migrants, they should be motivated to do their own job within Bangladesh that they are eligible to perform.
4. In order to stop the tendency of the household-heads to become unemployed when someone migrates from the family, they should be incentivized to invest the remittance they receive from their migrant family-member within Bangladesh.
5. Appropriate policy support should be provided both for the migrants and also for their family-members in the country to achieve the best out of the migration process.

Due to time and budget constraints, the migrants of the remaining 4 divisions of Bangladesh namely Rajshahi, Sylhet, Barisal and Rangpur could not be covered in the study. The future researchers in this field can conduct similar studies covering these divisions and also including other relevant variables to have more inclusive, representative and comprehensive results.

References

- Abusharaf, R. M. (1997). Sudanese migration to the new world: Socio-economic characteristics. *International Migration*, 35(4), 513-536.
- BMET. (2019). Retrieved 29 April, 2019, from www.bmet.org.bd
- Coleman, D., Compton, P., & Salt, J. (2002). Demography of migrant populations: The case of the United Kingdom. *The demographic characteristics of immigrant populations. Population Studies*(38), 497-552.
- Das, N., de Janvry, A., Mahmood, S., & Sadoulet, E. (2014). Migration as a risky enterprise: A diagnostic for Bangladesh.
- Das, N., de Janvry, A., & Sadoulet, E. (2015). Selection into International Labor Migration: Findings from the Baseline Survey of BRAC's Safe Migration Project: Working paper, University of California, Berkeley.
- Della Puppa, F. (2013). A bideshi in the middle of the Mediterranean Sea: Biographical trajectories and migration patterns in the Bangladeshi Diaspora in Italy. *Ars & Humanitas*, 7, 99.
- Gardner, K. (1995). *Global migrants, local lives: Travel and transformation in rural Bangladesh: Travel and transformation in rural Bangladesh*: Clarendon Press.
- Gardner, K. (2009). Lives in motion: the life-course, movement and migration in Bangladesh. *Journal of south Asian development*, 4(2), 229-251.
- Graham, E., & Jordan, L. P. (2011). Migrant parents and the psychological well-being of left-behind children in Southeast Asia. *Journal of Marriage and Family*, 73(4), 763-787.
- Hadi, A. (2001). International migration and the change of women's position among the left-behind in rural Bangladesh. *International Journal of Population Geography*, 7(1), 53-61.
- Hassan, M., & Jebin, L. (2018). Comparative 'Capability' of Migrant and Non-Migrant Households: Evidence from Rural Bangladesh. *Asian Economic and Financial Review*, 8(5), 618-640.
- Hossain, M. Z. (2001). *Rural-urban migration in Bangladesh: a micro-level study*. Paper presented at the Brazil IUSSP conference. August.
- Islam, M. N. (2007). Migration scenario: Nature, patterns and trends. *Country Paper Migration*.
- Joarder, M. A. M., & Hasanuzzaman, S. (2008). Migration decision from Bangladesh: permanent versus temporary. *Asia Europe Journal*, 6(3-4), 531-545.
- Joarder, M. A. M., & Miller, P. W. (2013). Factors affecting whether environmental migration is temporary or permanent: Evidence from Bangladesh. *Global Environmental Change*, 23(6), 1511-1524.
- Kuhn, R., Barham, T., Razzaque, A., & Turner, P. (2020). Health and well-being of male international migrants and non-migrants in Bangladesh: A cross-sectional follow-up study. *PLoS medicine*, 17(3), e1003081.
- Mallick, B. (2019). The nexus between socio-ecological system, livelihood resilience, and migration decisions: Empirical evidence from Bangladesh. *Sustainability*, 11(12), 3332.
- Mendola, M. (2008). Migration and technological change in rural households: Complements or substitutes? *Journal of Development Economics*, 85(1-2), 150-175.
- Morad, M., & Gombač, J. (2018). "PROBASHI" IN ITALY. NEW DESTINATIONS: TRENDS, ORIGINS AND PROFILES OF BANGLADESHI MIGRANTS IN PADOVA AND CADONEGHE. *Dve Domovini/Two Homelands*, 47(1), 37-52.

- Osmani, S. R. (1986). Bangladesh. Migration of Asian workers to the Arab world: Tokyo: United Nations University Press.
- Rahman, M. M. (2010). Remittances as a social process: the Singapore-Bangladesh remittance corridor. *Asian and Pacific migration journal*, 19(2), 265-294.
- Rahman, M. M. (2015). Migrant indebtedness: Bangladeshis in the GCC countries. *International Migration*, 53(6), 205-219.
- Rahman, M. M. (2018). Beyond labour migration: The making of migrant enterprises in Saudi Arabia. *International Sociology*, 33(1), 86-106.
- Rajan, S. I. (2018). Demography of the Gulf Region *South Asian Migration in the Gulf* (pp. 35-59): Springer.
- Romano, D., & Traverso, S. (2019). The Heterogeneous Impact of International Migration on Left-behind Households: Evidence from Bangladesh. *International Migration*, 57(5), 121-141.
- Ryan, L., Sales, R., Tilki, M., & Siara, B. (2008). Social networks, social support and social capital: The experiences of recent Polish migrants in London. *Sociology*, 42(4), 672-690.
- Sarker, M. M. R. (2017). Migration Flows in South Asia *Regional Cooperation in South Asia* (pp. 47-68): Springer.
- Sharma, M., & Zaman, H. (2009). *Who migrates overseas and is it worth their while? An assessment of household survey data from Bangladesh*: The World Bank.
- Sikder, M. J. U., & Higgins, V. (2017). Remittances and social resilience of migrant households in rural Bangladesh. *Migration and Development*, 6(2), 253-275.
- Singh, S., & Yadava, K. (1981). On some characteristics of rural out-migration in Eastern Uttar Pradesh. *Society and Culture*, 12(1), 33-46.
- Wang, X. (2018). Explaining Heterogeneity in Selection of Bangladeshi Migrant Laborers.
- Zeitlyn, B. (2006). *Migration from Bangladesh to Italy and Spain*: Refugee and Migratory Movements Research Unit.
- Zeitlyn, B. (2007). Senders turned into receivers: Spain, Italy and Bangladeshi migration.

Adaptive Strategy in Riverbank Erosion: A Study in Naria Upazila, Bangladesh

Abdul Kuddus*

Abstract: This paper is mainly focused on the vulnerabilities and adaptation process of the riverbank erosion affected people. As part of adaptation process most of the affected people have to migrate to anywhere from their native land but find out the channels they follow to be migrated is also the purpose of this study. The study employed mixed method to collect data from the respondents of the highest erosion prone area. To collect data this study used interview through semi structure questionnaires, focus group discussion (FGD) and case study methods. Findings show that affected people have to face different types of vulnerabilities. To come back from sufferings they take different types of strategies. As riverbank erosion washed away everything so their relatives and kinsmen help them in different ways. Most of the people migrate by following the channel of their relatives and acquainted as they can get support from them.

Keywords: Riverbank, erosion, adaptation, affected people, vulnerabilities.

1. Introduction

River Bank Erosion is one of the common natural disasters in Bangladesh (Iva et al., 2017: 373). Because Bangladesh is situated on the delta of the Ganges-Brahmaputra-Jamuna river systems, with more than three hundred perennial tributaries and distributaries, it is also among the world's most vulnerable countries to the effects of flooding and riverbank erosion. The major rivers of the country, namely the Ganges-Padma, Jamuna-Brahmaputra, and the Meghna, drain a 1,559,400 square kilometers catchment area, with only 7.5 percent of this area in Bangladesh itself (Hutton & Haque, 2003: 406). Bangladesh is suffering from acute riverbank erosion (Baki, 2014: 3). Every year, approximately one million people are affected by river bank erosion. River bank erosion not only compels people to migrate or leave their place of origin, but also destroys their belongings (Sarker & Rahman, 2018: 81). As the consequences, every year a sizeable population is affected by erosion. People not only lose their houses and agricultural lands but also become displaced often permanently and impoverished (Rana & Nessa, 2017: 60). Riverbank erosion causes huge amount of socio economic losses; from homestead loss to death. People suffer from lack of food and getting access in shelter. Most of the cases of riverbank erosion the people living on the bank have to migrate from eroded area to another for one time or more. The Padma is the biggest river in Bangladesh. In different areas, the bank of the River Padma eroded and also is eroding continuously. Different parts of the bank of the river have been eroding for a long time. But in mid-September 2018 the bank of The Padma River has eroded drastically and washed away numerous houses and vast amount of land.

On 10th September 2018 bdnews24.com had published news entitled "More than 4,000 people of Naria Upazila in Shariatpur have become homeless due to the erosion on the Padma River in the last seven days". In the detail part of the news bdnews24.com has said that-The upazila's Muktarer Char, Kedarpur Union and 4 No. ward of Naria

* Lecturer, Department of Anthropology, Jagannath University, Dhaka. Email: akuddusjnu@gmail.com

municipal area went under water due to erosion in the past last two months, according to the local government. A large portion of 200-year-old Mulfatganj Bazaar went under water last week. Mulfatganj Bazar, Char Jujura village, Kedarpur Daspara and Uttar Kedarpur were among the areas hardest hit by erosion. In addition to homes, all of the roads, bridges, culverts and the other infrastructures in the area have been submerged. River erosion devoured thousands of acres of farm land.

By reading the news about the sufferings of the affected people I decided to know how the affected people of Naria adapt themselves to this broken situation. Though the news addressed different eroded areas, but most vulnerable and severe erosion prone area was a part of Naria Municipality and Daspara Kedarpur village of Kedarpur Union. So, for this study, these two areas have been selected as research area for this study. As the news described that the affected people have lost houses, homestead land, arable land, damaged local roads, bridges and other infrastructures. In one word the people living on the bank of the Padma River beside Naria and Kedarpur have lost everything and become poor overnight. But one thing drew my attention that as they lost everything, so how they manage themselves i. e. how they adapt with their present situation? And migration is also part and parcel of the natural disaster induced people. So, in which channel they follow to be migrated was also the important part of the study.

2. Objectives

River erosion seriously affects the livelihood of the affected people. Being affected many people become asset less, homeless, landless, in a word poor overnight. They lose homestead, house, cultivable lands, kitchen garden/home yard land and many other properties (Baki, 2014: 30). While the majority of rural people do not have access to food, housing and medical facilities, the disaster of riverbank erosion further intensifies the rate of landlessness, homelessness, unemployment and under-employment every year. In such alarming and aggravated conditions as these, the displacee resiled themselves to formulate and undertake multiple measures and techniques for meeting their enormous socio-economic needs triggered by the riverbank erosion displacement and the consequential immense sufferings in the absence of organizational responses (Islam, 2007: 10). To get rid of their disastrous situation affected people had to take different steps. In their locality they had not anything by which they could manage their livelihood. So, they had to follow diversified techniques and methods to adapt with the changing situation. The objective of this study is to know the techniques of adaptation of the respondents after being affected. And if they wanted to be migrated for survival where they want to migrate; any place where they have relative or close kinsmen or anywhere they can.

Specific objectives of the study are-

- a. To find out the techniques of adaptation of riverbank erosion affected people.
- b. By reading the existing literature, it is found that migration is immediate strategy to the riverbank erosion affected people. But in which channel or way they follow to become migrated is a question. So, to identify the channels through which the affected people want to be migrated is also an objective of this study.

3. Methodology

The data for this study have been collected in several times from September to November of 2018. Different anthropological methods have been used to collect data for this study. Respondents have been selected through purposive sampling. To collect data interview through semi-structure questionnaires, Focus Group Discussion (FGD) and case study methods have been used. And to meet the needs of the study also has been taken part in different informal discussion with the affected people. Data have been collected from both primary and secondary sources. As a secondary source of data different books, related to the theme of the study, journals, reports of daily newspapers, and articles related to riverbank erosion have been reviewed. On the other hand, primary data have been collected from the respondents of the study area. Forty eight households have been selected on the basis on the severity of erosion to collect data by using purposive sampling. The household head was the respondent. Whenever the household head was absent, then his wife, and in the absence of household head's wife the elder son was considered as a respondent. Among them, I have collected data from thirty five respondents through interview and remaining thirteen respondents have been selected for focus group discussion. In different two groups of six and seven respondents were formed for sharing their experience of sufferings and adaptation due to riverbank erosion.

4. Research Area

I have collected data from the inhabitants of 4 no. ward of Naria Municipality and Kedarpur Daspara village of Kedarpur union under Naria upazila. Geographically both areas are located on the bank of river Padam. The statistical number of total population is not found because a number of affected people have made temporary house in these areas to survive immediately after riverbank erosion and some people may migrated somewhere. It has been changing the real statistics of the population of these tow areas. I have chosen these areas according to severity of erosion and sufferings of the people.

5. Reviewed Literature

Asian countries tend to be more vulnerable to riverbank erosion due to their high population density and poor economic conditions. Large sections of the population in these countries live along the rivers and are more likely to be affected by bank erosion (Das et al., 2017: 79). Bangladesh is one of the riverbank erosion prone and coastal over populated countries. Baki (2014) tried to outline some socio-economic impact on the affected people of Gorai riverbank erosion. He emphasized on the scenario of Kumarkhali of Kustia District. In his paper, he wanted to draw attention of policy makers and governor to ensure good governance and make policy to lessen the vulnerabilities of the people living on the bank of Gorai River.

Karim (2014) has done a thought provoking piece of work entitled 'Flood and Riverbank Erosion Displaces: Their Indigenous Survival Strategies in Two Coastal Villages in Bangladesh'. In the paper he outlined some strategies how the riverbank and flood affected people cope-up with the changing situation. He also gave importance to some indigenous mechanism through which displaced people of two marginal villages of Bangladesh migrate from their native land to another. Das et al. (2014) has identified the sufferings of the erosion induced displacement of the people of India. They said that displaced people suffer from different types of insecurities.

Zaman & Wiest (1991) addressed the resettlement issue of the people uprooted by riverbank erosion and the dispute created regarding domination on newly emerged char island and reallocation of the land. The scenario of the present study area is completely different from the study of Zaman and Wiest. Here is not any dispute regarding char land. But there is coherence among the affected people. And most of the cases the rich people give a piece of land without any cost to affected people to build or rebuild house. Amin (1991) described the settlement strategies of the riverbank erosion affected people of Bangladesh. He has also drawn attention of the policy makers to make policy as the displaced people due to riverbank erosion can be resource. Sarker and Rahman (2018) identified the volume of riverbank erosion migration and the way how to minimize erosion.

The degree of economic loss and vulnerability of population due to bank erosion was significant. For instance, the impact of land loss involved primarily the loss of homestead land, housing structures, crops, cattle, trees and household utensils. Admittedly, homesteads-loss instigated by the river erosion forced people to move to new places without any option and put them in vulnerable situations (Shetu et al., 2016: 194)

Alam (2017) indicated the vulnerabilities due to riverbank erosion in two highly erosion prone district Shirajgonj and Tangail. He stated that riverbank causes different vulnerabilities such as impact on livelihood strategies and access to food, water and health facilities. He described the poverty cycle, limited access to food that turn insufficient calorie and finally the affected people become the vulnerable to be sick. As they were economically poor, so they can not take proper treatment that disabled them to join the work from which they can earn wage.

Islam (2017) described vulnerabilities of riverbank erosion and intervention led by community people in three unions of a coastal District of Bangladesh. He has emphasized on different types of vulnerabilities and community resilience regarding riverbank erosion. Haque (1988) described the coping strategies of the riverbank affected people of Kazipur upazila of Sirajgonj. He identified individual and communal response to the hazard occurred by Jamuna riverbank erosion and also looked into the adjustment mechanism of the people. But it was 1990s, now situation has been changed. Specially, at present, along with government, different NGOs also play important role to recover vulnerabilities and sufferings.

According to the Department of Disaster Management (DDM), riverbank erosion, which is caused by the continuous shifting of channels, the three major rivers the Jamuna, the Padma and the Meghna alone displaces an estimated 500,000 people annually. Salt water intrusion from sea level rise in low-lying agricultural plains, along with other hazards, could lead to 40% decrease in food grain production and will force migration to urban slum areas (CDMP II, 2014:11).

From the mid of 2018 the bank of the Padma river beside Naria town of Shariatpur started to erode. In 18th September 2018 'The Daily Janakantha' published news on 'Naria Upazila under terrible erosion of the Padma River' (The Daily Janakantha, 18 September 2018). As most of the people lost everything; from homestead and arable land to business enterprise, so they have nothing remaining in their hand. To take a survival strategy they had to migrate to anywhere for livelihood. So if they migrate to any new areas, how they

introduce themselves, manage employment or Income Generating Activities (IGA) and in one word, to adapt them with the new locality is a tough job. There are some studies on the riverbank erosion, migration and the impact of erosion on livelihood. Among these, some papers had emphasized on the adaptation of the victims in different areas of the country. But there is a little research was found on strategies of adaptation of the affected people of Naria, Shariatpur. On this ground, this study tried to find out the techniques and strategies of adaptation of those people. And as part of adaptation people migrate to different areas of the country, but the question is which factors encourage them to be migrated in any particular area.

According to Anthony Oliver Smith (1996) “Three general perspectives on hazards and disasters have developed in anthropology: (a) a behavioral response approach, (b) a social change approach, and (c) a political economic/environmental approach”. In this study behavioral response approach and social change approach are so much related. After being affected by riverbank erosion people respond differently in different situation. The only individual response is not enough for recovering of this disaster. It is also a matter of concern that how people, community and other organizations respond to that disaster and through this response how they adapt themselves with the environment.

6. Result and discussion

A. Riverbank erosion and vulnerabilities

Riverbank erosion is an endemic natural phenomenon that occurs in Bangladesh. The vast flood plains of the three major river system-The Padma, The Brahmaputra-Jamuna and Meghna-have made Bangladesh one of the most vulnerable countries in the world to flood and riverbank erosion (Zaber et al., 2018:1). The damage occurs in many ways and the impacts can be as complex as the economy itself. Riverbank erosion has an adverse impact on the livelihood as homesteads are destroyed, cultivable lands are wiped out and employment opportunities are reduced. In most of the cases, homesteads in riverbank areas are located after the agricultural fields. Wiped out of homesteads implies that the family or individual lost the total assets (Uddin & Basak, 2006: 21). According to A. H. M. Zehadul Karim (2014) During the severe flood and riverbank erosion, the villagers faced many problems. In June 2018 Mustak Ahmed, a reporter of The Daily Jugantor, had predicted that “Roads, shops, houses, educational and religious institutions, markets and even hospitals may be destroyed by river erosion” (Ahmad, 19 June 2018). Prediction had turned into reality in mid-september of 2018. During my fieldwork, I also had witnessed the damages, vulnerabilities, and sufferings of the affected people. The Major impacts and vulnerabilities of riverbank erosion are;

- i. **Loss of infrastructure:** Riverbank erosion damages many infrastructures severely. According to the respondents, many houses, roads, culvers, educational institutions and business enterprises have gone underwater. BBC Bangla in their news entitled ‘River erosion in Bangladesh: This three-story house disappeared right before our eyes’ had described that “hundreds of houses and large structures have been submerged in the river Naria Upazila in Bangladesh due to severe erosion of the river Padma” (Kallol, 6 September 2018). In this news, it is said that a three stroyed building had gone underwater in a moment. Not only house but also all types of infrastructures had gone underwater. Govt. Upazila health

complex, non-government clinic and other infrastructures had completely ruined off.

- ii. **Eroding cultivable land:** Riverbank erosion in Naria has eroded a big amount of cultivable land and crops cultivated in Kedarpur Daspara village. One of the respondents had said that he got roughly two acres of land as inheritance but now he is completely homeless and has not any piece of land for cultivating.
- iii. **Extinction of educational and social institution:** It is found that two govt. school has gone underwater due to overwhelming riverbank erosion. Simultaneously many social and religious institutions like club and mosque also have vanished due to riverbank erosion. A sixty years informants said that “you did not see the erosion of the destructive Padma river, not only these two schools but the government have been establishing school continuously and the Padma river destructing these parallely”. He asked what will be by establishing school in such way. From the above statement, we can realize how the riverbank rupture made a spot in his mind.
- iv. **Disappearing road, embankment and bridge:** Riverbank erosion at first affects the embankments, roads, bridges and culverts. When embankment has eroded then tidal surges enter into the locality and by the hits of the current of the water muddy of the roads be fluid and all the infrastructures become weak and break down. In research area, a sizeable amount of roads had gone underwater and by the speed of the water, a bridge, linking with Mulfotgonj bazaar to the nearby village had completely vanished.
- v. **Annihilation of business enterprise:** The area of Mulfotgonj bazaar had become lessen due to continuous riverbank erosion. Nearly twenty shops in this bazaar had gone under the water in recent time-a respondent said. Furthermore, Sadhur bazaar launch ghat along with many shops and tea stalls have got missing within a few seconds.
- vi. **Vanishing home and homestead land:** All the respondents have experience of losing their home and homestead land because the area in which they are living now is not their ancestor’s locality. When I had conducted FGD all the respondents shared that they are now living in a temporarily made house because they had lost their homestead land house due to the severe riverbank erosion that occurred in May to October of 2018. But this is not the first time but they have been facing such types of sufferings for a long time.

Padma River eroded homestead land, agricultural land, pond and lost many others property likes homestead plants, tube well, crops of the victims in the study area (Ghosh & Mahbub, 2017: 66). Being affected by riverbank erosion the people of the study area follow some adaption strategies to cope up with the broken situation. In the next part, we will see what types of strategies the affected people follow.

B. Adaptation strategies

B.1 Migration

Migration is an inseparable part of the life of the people affected by riverbank erosion. All the informants of the research area have a long term traditional experience to be

migrated affected by riverbank erosion. Migration is the alternative way of livelihood management (Ghosh & Mahbub, 2017: 62). Being migrated to any area where there is no riverbank erosion gives sustainability in their livelihood options. The aged respondents stated that they have to be migrated several times in their lifetime. “Asian countries tend to be more vulnerable to riverbank erosion due to their high population density and poor economic conditions. Large sections of the population in these countries live along the rivers and are more likely to be affected by bank erosion” (Das et al, 2017: 79) and Bangladesh is also a country lies in South Asia. The people and resources of the country are under the threat of riverbank erosion due to its geographic and geologic settings and every year hundreds of people migrated from the study area with no source of food and shelter (Rana & Nessa, 2017: 68). Riverbank erosion constantly affects the life of the inhabitants living on the bank of river Padma, especially the erosion-prone part of Naria Upazila. But the decision to be migrated depends on the severity and vulnerabilities carried out by the riverbank erosion and also takes some time to decide by which channel and in which area they will be migrated.

As I have collected data immediately after riverbank erosion. Till then the people didn't migrated but planning to migrate to anywhere. In the question of migration they all are answered that they have not any livelihood option here without migrating. So they have expressed their planning of migration to different destinations.

Table 1: Planned destination of migration

| Intended Destination of migration | Number of Respondent | Percentage |
|---|----------------------|------------|
| Migration to Dhaka | 10 | 20.83 |
| Migration to Shariatpur | 6 | 12.50 |
| Migration to other Upazila of Shariatpur | 8 | 16.67 |
| Migration to other union of NariaThana | 5 | 10.42 |
| Migration to nearby shelter project | 9 | 18.75 |
| Migration to different part of Bangladesh | 10 | 20.83 |
| Total | 48 | 100 |

Source: Field work by author

According to the above table, we can see that all people want to or have to migrate to any area where they can survive. But the important thing is that most of the people want to migrate any cities or town area. There is more opportunity to manage work than rural area. But in disaster-migration pattern of the study area people willing to migrate both in cities and rural area also. People want to follow rural-cities migration, who are extreme loser due to riverbank erosion and also had lost everything. They have not any livelihood option or find any way of income. They are now in severe crisis. Informants said that as in cities area, there is more earning option so if they migrate to town, it is easy to find any work through which they can survive. On the other hand, those people who have not any skill and do not know any work without fishing and cultivating related activities they want to rural-rural migration if he migrated to another part of his union he can manage

the same work as before of the riverbank erosion. For example, a fisherman is completely dependent on the river and most of the fishermen do not know any other work by which he can earn wages. The table indicates that 18.75% of the respondents want to migrate to the nearby shelter project. Among this category, most of the respondents are fishermen and they are completely dependent on the river to manage livelihood. A portion of affected people (10.42%) want to migrate to the same union of their Upazila and most of the people belong here in agriculture related activities. So for them it is easy to get work in rural areas rather than cities. But those people who have technical knowledge for example, tailoring, rickshaw pulling or driving motor vehicle they want to migrate any cities. And people who earn wages through seasonal work they have not any problem to migrate anywhere in Bangladesh.

People affected by riverbank erosion migrate to different areas and in different scale. According to the statement of the respondents where they will be migrated is depend on the severity of erosion, having alternative livelihood options or not, the opportunity to get any work, having or not any relative who can help him there, having any land or not etc. These people have been facing and gathering experience of riverbank erosion. So they know where they have to be migrated. According to them, affected people usually want to a) Short distance migration, b) Long distance migration, c) Short term migration and d) Long term migration.

B.2 Migration Channel

For migration the people are choosing those areas where they have easy access, get land to cultivate, have necessary support from their relatives, scope of job opportunities, better life guarantees, have educational opportunity and access of basic needs (Bhuiyan et al., 2017: 11). Where they migrate is not fact, but important is every affected family has to migrate anywhere in the country. River erosion bound them to migrate. The remarkable thing is that people affected by riverbank erosion migrate through a channel where they have relatives, kinsman, any acquainted people or at least to a person who is known earlier. To be migrated every affected person some how follow one or more channel of their relative, neighbor or a man known earlier to migrate anywhere. According to the respondents, most of the people migrate somewhere one or more person is known earlier to him or his family members. And at the time of crisis those kin groups, relative or acquainted extend their hand to help the affected people. For example, when a family lost everything they yield help from anywhere they get. At this time members of the family are trying to find out options to go there to get shelter and generate income. The relatives living Dhaka or anywhere invite them to move on there to survive. When the affected people go to their relatives, they help them in different ways; to feed them for some days until s/he get work, to help them for hiring residence, to introduce them to the other people that help them to get work and to get daily necessary product from any shop. For example, if an affected man wants to pull a rickshaw anywhere in the city he will not get any rickshaw for pulling because he has not any relative or close person who can guarantee about him. One the other hand, most of the affected people lost everything and s/he has not cash money in hand as an advance that have to pay to hire residence. Relative or acquainted person helps migrants in these sections. But the question is if anybody has not any relative or channel what is his or her condition? He also can migrate and manage work, but he or she does not get such type of assistance that's why s/he has

to go through hardship. To overcome this hardship s/he has to lend money and has to pay high rate of interest against received money.

C. Changing food habit and taking low cost food

In the crisis situation after eroding riverbank most of the people pass their time within very hardship and vulnerable condition. Scarcity of and insecurity to taking three times meal sufficiently in a day is a hard reality in the affected area. To adapt with the changing conditions, some families cannot take three times meal in a day. So they bound to change their food habit i. e. instead of taking three time meals in a day they take two or one time meal a day. On the other hand, they take cheaper food than before. Female members of the family play a significant role in this context. They arrange vegetable from the courtyard and rice from the home where they work as a maid servant. She supports her family in different ways at crisis moment. But the important thing is that the all members of the family try to take the cheapest food to minimize family income and management through the least amount of income.

D. Taking support from NGOs

As riverbank erosion takes away everything of the affected people so they have to borrow money from NGOs or local money lenders. In both cases, they have to pay interest against the money which they have taken. But in some cases, both NGOs and the local money lender remit the interest for a particular period of time. But respondents feel free to take money from NGOs because they have some rules and regulations to give and take the money. Everyone is not able to get money from the local lender. And sometime they impose pressure to back all the money in a certain period. The interesting thing is that rich relatives and neighbors play important role in this context. If affected people take money from them, they do not have to give interest against the money. And payment system is comparatively flexible other than NGOs and other lending system.

Now a day NGOs play an important role to recover the damage and sufferings due to riverbank erosion. From disaster preparedness to evacuation they help the disaster induced people in various ways. According to the respondents, NGOs help the affected people in two ways; a) stop collecting their premium form the affected people for a certain period and b) give relief as primary response and give loan to restart the business and rebuild housing. Most of the cases they give the relief to their clients to strengthen their relation to the clients. But the relief is not enough for the people. In their client-protection programme, they allow clients to withdraw part of their savings, both compulsorily and voluntarily; and reschedule mandatory contributions until normalcy returns (Matin & Taher, 2001: 234). So they take loans from NGOs and try to build their house and restart their business. We can look at the case of Shetu.

Case # 1

Shetu is a 16 year old boy. His father has been suffering from an acute disease for a long time. Now he is totally disabled to do anything. To face riverbank erosion in several times his family is completely empty hand now. He and his mother were catching the shrimp fry (baby shrimp) in the Padma River along with their small scale business. Catching shrimp fry is a seasonal work. They took it as a part time work.

Their main income came from the small business. But in riverbank erosion of 2018 it totally went to the river. They saved some money to an NGO to buy a piece of land to build house. But sudden riverbank erosion stopped the effort of building a house. They instantly withdrew all the money they have been saved in and took some money as loan to regenerate their income through buying an auto (a three wheeled vehicle). Now, the earning from auto driving is the main source of income for shetu's family. With the income shetu is managing his family and giving the premium against the loan.

7. Conclusion

Riverbank erosion is one of the severe natural disasters in Bangladesh. People affected by this disaster have to face different types of sufferings and vulnerabilities. People living in the erosion-prone areas have suffered from infrastructure damage and breaking social bonding that they have maintained earlier. Riverbank erosion has taken away all the belongings of the inhabitants of the study area. So they have to take different types of techniques and strategies. For example, they can not manage food for the members of the family. Even they had to take the cheapest food than they took before erosion. Being migrated people have been transferred in a short distance, to a neighbor's and relative's houses or any other nearby shelter centers as part of the response to emergency situations. But this is not the ultimate solution for their survival. Migration is an important strategy for their survival. But in which area they will be migrated is completely depends on whether they have close kin, friends, neighbors and the acquainted person or not. This type of channel of migration plays an important role in the survival of the affected people. If the government, in particular Water Development Board (WDB) and other responsible organizations, which have been working in this sector take timely and need-based actions to save the embankment in the high erosion-prone areas on the Padma River then the people can save them from these types of miseries. Policymakers should rigorously visit the area and take the point of view of the native people, who have been living in this area for a long time and have practical experience of coping up with the broken situation. It is impossible to cover all the issues related to riverbank erosion by any particular study. So further interdisciplinary study should be undertaken to explore the holistic scenario of the riverbank erosion and lessen the impacts.

Reference

- Ahmad, Mustak (19 June 2018). CEGIS forecasts loss of 2,000 hectares, Padma-Jamuna erosion. *The Daily Jugantor*. <https://www.jugantor.com/todays-paper/last-page/317304/>
- Alam, G. M. M. (2017). Livelihood Cycle and Vulnerability of Rural Households to Climate Change and Hazards in Bangladesh. *Environmental Management*, 59(5), 777–791. <https://doi.org/10.1007/s00267-017-0826-3>
- Amin, A. T. M. N. (1991). Settlement strategy for riverbank erosion displacees in Bangladesh: A human resource development approach. *Riverbank Erosion, Flood and Population Displacement in Bangladesh, January 1991*, 336–353.
- Baki, A. T. M. A. (2014). Socio-economic impacts of Gorai riverbank erosion on people: A case study of Kumarkhali, Kushtia. *Unpublished M.A. dissertation*, Institute of Governance studies, Brac University, Dhaka.

- Bhuiyan, M. A. H., Islam, S. M. D.-U., & Azam, G. (2017). Exploring impacts and livelihood vulnerability of riverbank erosion hazard among rural household along the river Padma of Bangladesh. *Environmental Systems Research*, 6(1). <https://doi.org/10.1186/s40068-017-0102-9>
- Das, T. K., Haldar, S. K., Gupta, I. Das, & Sen, S. (2014). River bank erosion induced human displacement and its consequences. *Living Reviews in Landscape Research*, 8(1), 1–35. <https://doi.org/10.12942/lrlr-2014-3>
- Das, T. K., Haldar, S. K., Sarkar, D., Borderon, M., Kienberger, S., Das Gupta, I., Kundu, S., & Guha-Sapir, D. (2017). Impact of riverbank erosion: A case study. *Australasian Journal of Disaster and Trauma Studies*, 21(2), 73–81.
- Ghosh, B. K. & Mahbub, A Q M (2017). Riverbank erosion induced migration: A case study of Charbhadrasan upazila, Faridpur. *Oriental Geographer*, 58 (1)
- Haque, C. E. (1988). Human adjustments to river bank erosion hazard in the Jamuna floodplain, Bangladesh. *Human Ecology*, 16(4), 421–437. <https://doi.org/10.1007/BF00891651>
- Hutton, D., & Haque, C. E. (2003). Patterns of coping and adaptation among erosion-induced displacees in Bangladesh: Implications for hazard analysis and mitigation. *Natural Hazards*, 29(3), 405–421. <https://doi.org/10.1023/A:1024723228041>
- Islam, M., Parvin, S., & Farukh, M. (2017). Impacts of riverbank erosion hazards in the Brahmaputra floodplain areas of Mymensingh in Bangladesh. *Progressive Agriculture*, 28(2), 73–83. <https://doi.org/10.3329/pa.v28i2.33467>
- Islam, M. Z. A. (2007). Social Resilience of the riverbank erosion displacemtn in Bangladesh. Pushpam K. & Sudhakara R. (eds.) *Ecology and Human Wellbeing*. Sage Publication, ISBN-978-0-769-3553-7 (HB).
- Iva, T. T., Hazra, P., Faisal, M., Saha, S., & Hossain, S. (2017). River bank erosion and its impact on population displacement in Bauphal upazila under Patuakhali district, Bangladesh. *Journal of Science Technology and Environment Informatics*, 5(2), 371–381. <https://doi.org/10.18801/jstei.050217.39>
- Kallo, K. (6 September, 2018). River erosion in Bangladesh: This three-storey house disappeared right before our eyes. *BBC Bangla*. <https://www.bbc.com/bengali/news-45433690>
- Karim, A. H. M. Z. (2014). Flood and riverbank erosion displacees: Their indigenous survival strategies in two coastal villages in Bangladesh, *Asian Social Science*, 10, 16-26. <https://doi.org/10.5539/ass.v10n4p16>
- Martin, N. & Taher, M. (2001). *The Changing Emphasis of Disasters in Bangladesh NGOs Nilufar Matin Natural disasters in Bangladesh : an overview*. 25(3), 227–239.
- Oliver-Smith, A. (1996). Anthropological Research on Hazards and Disasters. *Annual Review of Anthropology*, 25(1), 303–328. <https://doi.org/10.1146/annurev.anthro.25.1.303>
- Rahman, S. H., Faisal, B. M. R., Rahman, M. T., & Taher, T. B. (2016). Analysis of VIA and EbA in a river bank erosion prone area of Bangladesh applying DPSIR framework. *Climate*, 4(4). <https://doi.org/10.3390/cli4040052>
- Rana, M. S. & Nessa, A. M. (2017). Impact of Riverbank Erosion on Population Migration and Resettlement of Bangladesh. *Science Journal of Applied Mathematics and Statistics*, 5(2), 60. <https://doi.org/10.11648/j.sjams.20170502.11>
- Sarker, S. & Rahman, M. M. (2018). Trend Analysis of Bank Erosion of Jamuna River and Migration Impact: A Case Study on Teota Union of Shibalaya Upazila. *Journal of Bangladesh Institute of Planners*, Vol. 9(April), 81–93.
- Shetu, M., Islam, M., Rahman, K., & Anisuzzaman, M. (2016). Population displacement due to river erosion in Sirajganj district: Impact on food security and socio-economic status.

- Journal of the Bangladesh Agricultural University*, 14(2), 191–199.
<https://doi.org/10.3329/jbau.v14i2.32694>
- Uddin, a. F. . A., & Basak, J. K. (2006). *Effects of Riverbank Erosion on Livelihood*. 1–39.
- Zaber, M., Nardi, B., & Chen, J. (2018). Responding to riverbank erosion in Bangladesh. *Proceedings of the 1st ACM SIGCAS Conference on Computing and Sustainable Societies, COMPASS 2018*. <https://doi.org/10.1145/3209811.3209823>
- Zaman, B. M. Q., & Wiest, R. E. (1991). *Riverbank Erosion and Population*. 13(3), 29–33.
- CDMP II (2014). Trend and impact analysis of internal displacement due to the impacts of disaster and climate change. *Study report*, June-2014, Misnistry of Disaster and Relief, Dhak, Bangladeh.
- Economic Census (2013). *District report, Shariatpur*. Bangladsh Buereau of Statistics (BBS), Statistics and Information Division, Ministry of Planning, Dhaka, Bangladesh.
- The Daily Janakantha, 18th September, 2018. www.thedailyjanakantha.com
- [www. Bdnews24.com](http://www.Bdnews24.com), 10th September, 2018.

Does Access to Safe Water and Improved Sanitation Facility Ensures Better Environmental Health Outcome? A Cross-Sectional Study on Rural Bangladesh

Saima Ansar Jui*
Amin Masud Ali**

Abstract: This study investigates the environmental health outcomes of better access to safe and improved water and sanitation facility using the Household Income and Expenditure Survey Dataset of Bangladesh. Applying a cross-sectional analysis, the study examines whether individuals with better access to improved water and sanitation facility are less exposed to water, hygiene and sanitation related diseases in rural Bangladesh. Econometric modelling was applied to identify the determinants of water, hygiene and sanitation related disease prevalence and how those two indicators influence the probability of disease prevalence. Besides, the study also investigates whether this probability varies across different income groups and regions. Results reveal that access to improved sanitation facility significantly reduces the disease prevalence rate, whereas access to safe water fails to show any significant effect. Moreover, the impact of sanitation is relatively more significant in lower-income groups. Among other variables, level of education, gender, and dwelling features significantly determine the probability of disease prevalence. A large regional variation is also prominent regarding both access to those facilities and environmental health outcomes.

Keywords: Environmental health outcome, sanitation, safe water, disease, Bangladesh.

1. Introduction

Access to clean and safe drinking water and improved sanitation facility are considered as the significant indicators for sustainable development which affect the environmental health outcomes directly. According to the World Health Organisation's Global Nutrition Report (2017), the largest part of the disease burden and death in developing countries, comes from water and sanitation contaminated illnesses. Therefore, it is necessary to have a safe, inexpensive, easily accessible and sustainable water supply and latrine facility, to get a healthy and enhanced life. Recognising the importance, these two indicators were set in the Millennium Development Goals and later included in Sustainable Development Goals (UN 2016). However, despite placing such great emphasis, 2.1 billion people are in lack of safe drinking water, and about 4.5 billion are still in lack of access to basic sanitation services and almost 361 000 children under 5 years of age die due to diarrheal diseases according to the latest survey (WHO 2017).

Literature comprehends a strong debate on whether an increase in the coverage of safe water and improved sanitation facility ensures better environmental health outcomes. More precisely, the argument is whether they are capable of reducing the prevalence of water, sanitation and hygiene-related diseases or not. Empirically investigating the causal relationship, studies have produced inconsistent and conflicting evidence. For instance,

* Research Associate, Centre for Policy Dialogue (CPD), Dhaka-Bangladesh.
Email: saimaansarjui@gmail.com

** Associate Professor, Department of Economics, Jahangirnagar University, Dhaka-1231, Bangladesh.
Email: aminmasudali@gmail.com

studies have found the evidence that better access to water and sanitation improves the quality of daily life and reduces the risk of water contaminated diseases (Prüss-Ustün et al. 2015; dos Santos & Gupta 2017). There are also a few country-specific studies claiming such an inverse relationship. For example, Duflo et al. (2015) on India, Liu et al. (2013) on Nepal, Abubakar (2017) on Nigeria found that increase in coverage of such facility reduces disease prevalence.

Conversely, another set of studies (e.g., Engell and Lim 2013; Barnard et al. 2013; Dangour et al. 2013; Patil et al. 2014) have found little or no impact of water and sanitation intervention programs on reducing the prevalence rate of those diseases. Among them, Engell and Lim (2013) conducted a meta-analysis which combined the results of 84 relevant studies (conducted in between 2010 and 2012) and found that no additional health benefits can be achieved by increasing the coverage of pipe line water supply or improved latrines rather it largely depends on the proper usage, maintenance and consciousness. Studies have also argued that there are some supplementary issues like, usage of the facility and social practice (Convenient access to water, willingness to pay for improvements in water quality and no hand washing or no safe disposal of child feces) and health beliefs play a vital role in determining the outcome rather than the coverage of those facilities (Barnard et al. 2013; Gertler et al. 2015; Guiteras et al. 2015).

There are also few studies on Bangladesh investigating the relationship (e.g., Rana, 2009; Sultana et al. 2013; Arnold 2013; Akter et al. 2015; Benjamin-Chung et al. 2017). However, the findings of those studies are also mixed and conflicting. For instance, Rana (2009) conducted an experimental study on 50 sub-districts of Bangladesh to investigate the effect of water, sanitation and hygiene (WASH) intervention of BRAC on self-reported waterborne diseases (Diarrhea, dysentery, worm infections and typhoid fever). The study found that the overall prevalence of waterborne diseases reduced from 10% at baseline to 7% and among children aged under-five the reduction rate was from 22% to 13%. Contrarily, Arnold et al. (2013) while investigating the relationship for rural Bangladesh found little evidence in favour of the water and sanitation intervention affects diarrhea and growth of infant and young children. Similar results were also observed by Benjamin –Chung et al. (2017) while investigating the implementation quality of the SHEW-B (water Sanitation and Hygiene) program of UNICEF.

It is evident from the literature that the majority of the studies either investigated the impact of a particular intervention (water and sanitation) program or examined the relationship considering a specific area or region. However, the social practice, health beliefs, and the overall socioeconomic condition vary across different heterogeneous income groups and across different regions. This variation may also influence the causal relationship as the usage and maintenance of the improved facilities (regarding water and sanitation) depends on health and hygiene related consciousness which is determined by household or individual's socioeconomic background. Therefore, program and region-specific studies have limited scope in generalising the results for the whole population. It requires a nation-wide and more comprehensive analysis to incorporate and control the unobserved heterogeneity issue and examine the relationship to make a robust inference regarding the whole population. Hence, this current empirical study intends to mitigate this gap in the literature by investigating whether access to improved water and sanitation infrastructure reduces the probability of related hygiene, sanitation and waterborne

disease prevalence in rural Bangladesh, by using a household level national dataset covering the whole country.

The study conducts the investigation on Bangladesh, a highly populated country where irrespective of achieving considerable progress in ensuring the access of safe water and improved sanitation, water and sanitation contaminated diseases like diarrhea and cholera are still epidemic. Besides examining how access to safe water and improved sanitation facility influences the probability of disease prevalence, the study also investigates the variation of probability across different income groups and different regions by including several determinants (socioeconomic, demographic and geographic) that may differentiate the disease prevalence rate. Results of this study reveal that access to improved sanitation facility is significantly associated with disease prevalence rate. Access to safe water, however, failed to show any significant association. Among the other variables, level of education, gender, and dwelling features significantly determine the probability of disease prevalence. The study also shows that the probability varies significantly across different income groups and across the regions of Bangladesh. The study makes a noble contribution in literature by conducting such an investigation covering the whole country and by showing that the determinants of disease prevalence have diversified effects depending on several socioeconomic, demographic, and regional characteristics.

The rest of this paper is constructed in the following manner: Section 2 establishes the theoretical framework to illustrate the link between water and sanitation facility with water, sanitation and hygiene related diseases. Afterwards, Section 3 provides the methodology of the empirical analysis which contains the variable description and econometric modeling. The article continues with the descriptive and empirical results being thoroughly discussed in Section 4 and Section 5, respectively. Finally, the conclusion is placed in Section 6.

2. Theoretical framework

Environmental health indicators are the “tools for measuring, through direct or indirect procedures, an important feature of an environmental health issue,” which “can be used to evaluate and interconnect the status of and trends in overall environmental health” (NACCHO, 2000). According to WHO, the most common environmental health indicators are: “a) Access to basic sanitation (Proportion of the population with access to adequate excreta disposal facilities), b) Access to safe and reliable supplies of drinking water (Percentage of the population with access to an adequate amount of safe drinking water in the dwelling or within a convenient distance from the dwelling) and c) Connections to piped water supply Percentage of households receiving piped water to the home” (WHO, 1999). Diarrhea morbidity and mortality in children under five years of age and Water-borne diseases (outbreaks of water-borne diseases) are the common health indicators to monitor the effect of unsafe water and sanitation (WHO, 1999). Literature suggests that there are multiple pathways through which poor or limited access to those facilities causes multiple health and environmental hazards. Figure-1 (below) displays the plausible channels.

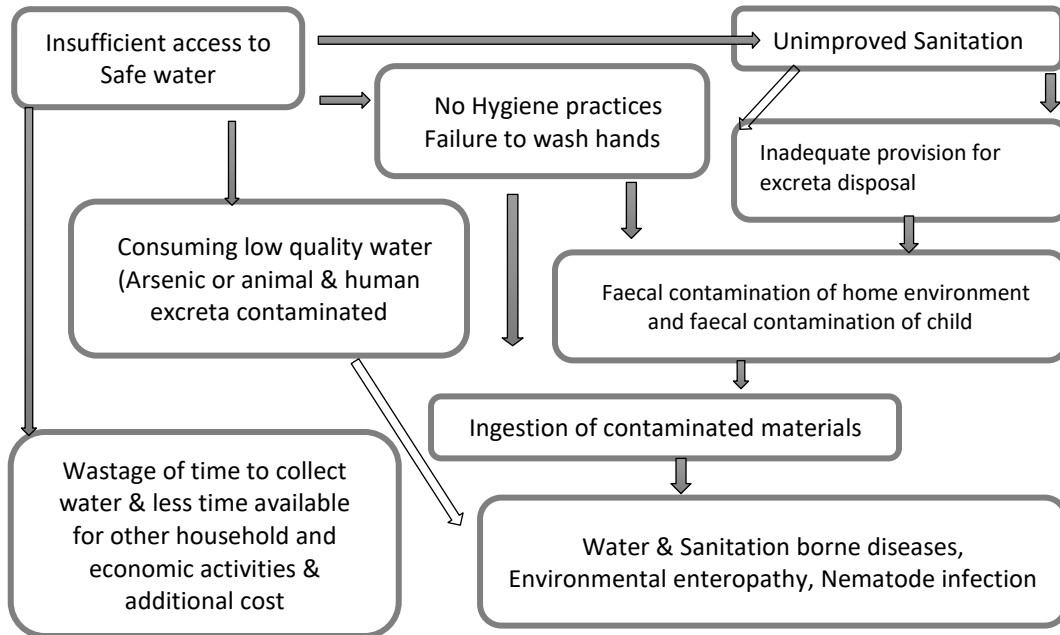


Figure 1: Conceptual framework presenting the channels through which poor water and sanitation facility causes water, sanitation and hygiene related diseases

Source: Adopted from Dangour et al., 2013.

Because of unavailability of safe water people may turn to low quality of water both for drinking and other household activities which will directly cause diarrhea and other waterborne disease (Briend, 1990). Besides, the sanitation system will not work properly because of lack of water. Lack of hygiene practice and inadequate provision for excreta disposal will cause faecal contamination of children and the environment. There will be also direct ingestion of contaminated materials because of such a reason. Moreover, human excreta have been implicated in the transmission of many infectious diseases, including cholera, typhoid, infectious hepatitis, polio, cryptosporidiosis, and arsenicosis. Malnutrition, pneumonia, worm infestations, are also associated with unsafe water, poor sanitation and hygiene resulting in reduced physical growth, weakened physical fitness and impaired cognitive function, particularly for children under the age of five (WWAP, 2015). Ultimately besides causing environmental enteropathy and nematode infection (Humphrey 2009), there will be a considerable amount of wastage of time and loss of financial resource because of limited access to these environmental health indicators.

3. Research method

The objective of this study is to investigate whether better access to water and sanitation facilities reduces the probability of water-sanitation and hygiene-related disease prevalence. As a part of the methodology, descriptive statistics and as well as econometric modelling (Probit model on the probability of disease occurrence for the overall sample and on different income groups) have been used for identifying the influence of water and sanitation facilities on the probability of water and sanitation contaminated diseases prevalence on the rural households of Bangladesh. Bivariate analysis is conducted initially using chi-square and ANOVA test in STATA to find out

how different variables are correlated with the dependent variable and how they vary across different income quintiles and regions (administrative divisions).

3.1 Theoretical background of probit model

In the case of a binary dependent variable, the Linear Probability Model is not useful as it holds the assumption that the conditional probability function is linear (Gujarati and Sangeetha, 2007). As a solution Probit and Logit models are useful as they use a nonlinear function to model the conditional probability function of the dependent binary variable. In this study, we have used Probit regression model. A cumulative standard normal distribution function $\Phi(\cdot)$ is used in the probit regression. Therefore, the model assumes,

$$P(Y=1|X) = \Phi(\beta_0 + \beta_1 X) \quad - (1)$$

In the above equation, $\beta_0 + \beta_1 X$ plays the role of a quantile z [where, $\Phi(z) = P(Z \leq z)$, $Z \sim N(0,1)$] such that the coefficient β_1 is the change in z associated with a one-unit change in X . Therefore, although, the effect of change in X on z is linear, the association between the dependent variable Y and z remains nonlinear as Φ is a nonlinear function of X . However, as Y is a nonlinear function of X , the coefficient β_1 does not have the conventional interpretation. To obtain the expected change in the probability that $Y=1$, first, we need to compute the predicted probability that $Y=1$ for the original value of the dependent variable. Next, we have calculate the predicted probability that $Y=1$ for $X+\Delta X$, and finally, we obtain the difference between both predicted probabilities to get the marginal impact of ΔX . However, in STATA software, this can be computed by using *mf* command after the probit regression or using *dprobit* command which directly reports the marginal effect rather than the coefficients. In this study, we have used *dprobit* command to obtain the marginal impact.

Probit regression (showing the marginal effect) is used in this study to find out the association between the explanatory variables (access to water and sanitation facilities) and the dependent variable (Disease). Furthermore, all the individuals are divided into few income groups (based on per capita household income), and separate Probit regression has been run on each group to investigate the marginal impact of the determinants on the probability of disease in each income groups.

3.2 Data source

This cross-sectional study uses Household Income and Expenditure Survey, HIES-2010 dataset (a survey on 12000 households) which is till now the publicly available updated dataset. This study focuses only on the rural settings. It is 7840 households (which contain 35903 individuals) out of 12400 sample households of HIES-2010 that belongs to the rural areas. The questionnaire of the survey includes a section (section 3) on Health, where self-reported morbidity information is captured (more specifically it asks whether any type of acute or chronic diseases occurred during the 30-day period prior to interview) with other relevant information. The questionnaire contains a long list of diseases. This study considers only the water and sanitation hygiene-related diseases from that list which is used as the dependent variable. It uses WHO classification of water sanitation related diseases. Moreover, section 6 in the questionnaire contains specific questions regarding dwelling information. Access to safe water (source of water for

drinking and other household purpose and whether it is arsenic tested and arsenic free) and improved sanitation (which are the main explanatory variables of our study. To avoid the criticism of inaccurate recall or individual's limited knowledge about illness experience on self-reported morbidity (Murray and Chen, 1992), the national questionnaire uses a limited recall period (30 days) incorporating cultural context and necessary training to collect accurate and complete information.

3.3 Model specification and variable description

To investigate the impact of access to water and sanitation facilities on the probability of disease we construct the following model to apply Probit regression:

$$D_i = \alpha + \beta \cdot Water_i + \mu Sanitation_i + \lambda X_i + u_t$$

Where, D_i is a categorical variable which takes value '1' if the individual affected by water, and sanitation related diseases in the last 30 days and equal to '0', if not affected. This variable is used as the indicator for health outcome measured by water and hygiene related diseases among respondents which include Diarrhea, Malaria, Cholera, Dysentery, Typhoid, Scabies, Arsenicosis and Jaundice. The variable $Water_i$ is a categorical variable showing whether the household have access to safe water (pipeline or tube well water with no arsenic contamination) for drinking and other purposes. The variable $Sanitation_i$ is also a categorical variable, which is used to identify whether the household have improved toilets in home compound (Improved toilet is defined as if it is sanitary or water seal or pit). X_i is a set of control variables. Household and individual's demographic and socioeconomic characteristics are taken as control variables based on relevant literature (Pattanayak et al., 2010; Adams et al., 2016; Abubakar, 2017). As per controls demographic features (age, sex, household size, household density), level of education (of the individual, mother and father), dwelling feature (separate kitchen, dining, access to electricity), and socioeconomic condition (earning status, land holding, access to safety net) are included in the model which affects both the access to water and sanitation facility and also the disease prevalence rate as suggested by the literature. A brief description of the variables is presented in Table 1(below).

Table 1: Description of the variables

| Variable | Description |
|-----------------------|--|
| Dependent Variable: | |
| Disease | =1; if individual is affected by water and sanitation borne disease in the last 30 days; = 0, otherwise. This study considers the following diseases related to water, hygiene and sanitation on the basis of relevant literature : Diarrhea, Malaria, Cholera, Dysentery, Typhoid, Scabies, Arsenicosis and Jaundice. |
| Explanatory Variable: | |
| Water | =1, if household has access to safe water for drinking and other uses; 0 if otherwise. Piped line supply water and tube-well (not arsenic contaminated) is defined as safe water. |

| Variable | Description |
|-----------------------------------|--|
| Sanitation | =1, if household has access to improved toilet; 0, otherwise. Improved toilet in this study is defined as if it is sanitary / water seal / pit; |
| Control Variables: | |
| Age of the patient | In years |
| Sex of the patient | =1, if Female |
| Education | Years of education of the patient |
| Religion | =1, if Islam |
| Mother's age | In years |
| Mother's education | Years of Education |
| Age of the head | In years |
| Head's education | Years of education |
| Household density | Members living per room. |
| Separate dining | =1 if separate dining room is available in the dwelling; = 0, otherwise. |
| Separate Kitchen | =1, if separate kitchen is available in the dwelling; = 0, otherwise |
| Electricity | =1, if household has electricity connection; =0, otherwise |
| Patient's earning status | =1, if earner; 0, otherwise |
| Mother's earning status | =1, if earner; 0, otherwise |
| Benefit received from safety nets | =1, if Yes; 0, otherwise |
| Landholdings | (in decimal) |
| Per capita income* | Per capita income of the household |
| Regional dummies | 7 regional dummies for 7 administrative divisions |

Note: per capita income is used to construct the income quintiles.

4. Descriptive results and discussion

The analysis starts with an overall overview reported in Figure 2 (below), which shows the scenario of water and sanitation contaminated disease prevalence in rural Bangladesh. Figure 2 shows that among the total rural observations (35,903), 91.44% people have safe water, 44.09% have sanitary latrine facility and 42.57% people have both the facilities. Amid the rural observations, about 2.22% of people are affected by water-borne and hygiene contaminated diseases. Among them, 60.65% (484) have no access to safe water

and improved latrine facility, which shows the rationale behind taking safe water and latrine as the main dependent variables. Surprisingly, 39.35% (314) people have access to safe water and sanitary latrine although they are affected by diseases, which project the necessity of including other predisposing and enabling factor into the analysis of the study.

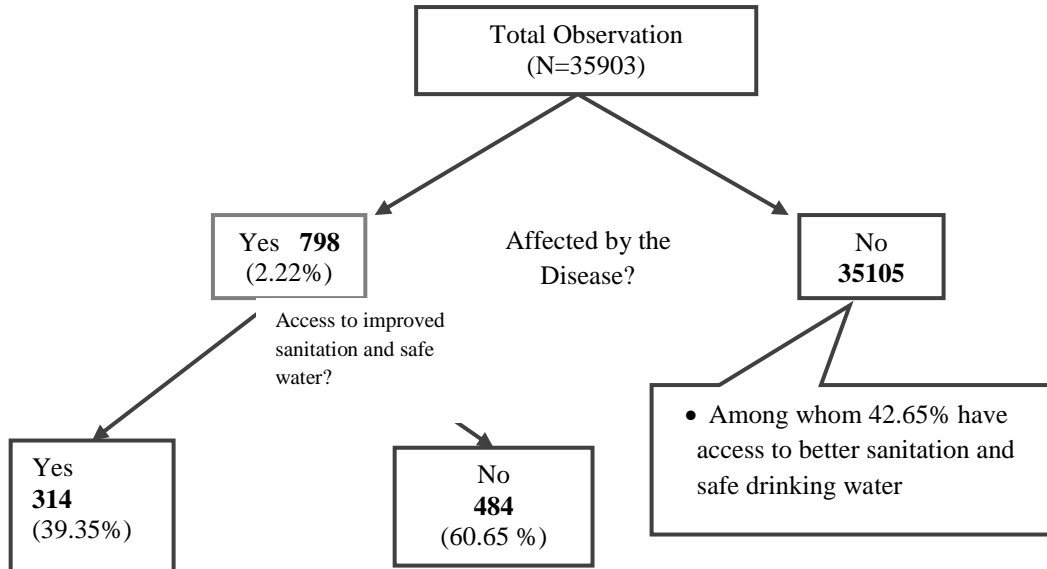


Figure 2: Water and sanitation related disease prevalence in rural Bangladesh.

Source: Own construction based on HIES data

4.1 Variation in disease prevalence

The study also investigates the variation in water and sanitation related disease prevalence across different income groups and different administrative divisions. Table 2 (below) confirms that disease prevalence rate does not vary significantly across the income quintiles as more or less the percentile distribution is the same for all income quintiles. Moreover, the chi-square value (2.046) is low and not statistically significant.

Table 2: Quintile wise variation in disease prevalence

| Variable Name | | Income Quintiles | | | | | Obs. | Chi square |
|---------------|--------------|------------------|-------|-----------------|-------|---------|--------|------------|
| | | Poorest | 2nd | 3 rd | 4th | Richest | | |
| Disease | Affected | 19.05 | 21.05 | 21.05 | 18.67 | 20.18 | 798 | 2.0455* |
| | Not Affected | 20.06 | 19.94 | 20 | 20.02 | 19.98 | 35,105 | |

***p<0.01, **p<0.05, *p<0.1

Table 3 (see Appendix) displays the regional variations (considering administrative Divisions) in disease occurrence by income quintiles. Data shows that 77(9.65%), 163(20.43%), 145(18.17%), 142(17.79%), 122(15.29%), 80(10.03%) and 69(8.65%)

patients are from Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet Divisions, respectively. Therefore, the highest disease occurrence is found in Chittagong (20.43%), and the lowest is in Sylhet (8.65%). In Barisal and Rangpur, the poorest quintiles contain the highest share of disease prevalence, and it declines as we move from poorest to the richest quintile. Usually, the richest quintiles have the lowest share of all except in Chittagong and Sylhet Division (where the share of the richest quintile is 31% and 21%, respectively). However, the variation in disease occurrence across the income group is statistically significant only in Chittagong and Khulna (at 1% and 5% level of significance).

4.2 Variation in access to safe water and improved toilets facility

Table 4 and Table 5 (see Appendix) shows quintile and regional variation of access to safe water and sanitation facilities. We start our discussion with access to safe water. Table 4 shows that in all the regions (Divisions) there is significant quintile wise variation (at 5% and 1% level) in access to safe water apart from Rajshahi Division. The table also shows that about 3.7%, 18%, 6.9%, 14%, 1.8%, 0.8% and 6.1% people do not have access to safe water in Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet Division respectively (in our sample). Therefore, Rangpur division has the lowest rate and Khulna division has the highest percentage of individuals with the unavailability of safe water. In the overall sample, we find that 8.6% people do not have access to safe drinking water, and there is also significant quintile wise variation in access to this facility.

On the other hand, regarding improved toilet facility, Table 5 (see Appendix) shows that about 21%, 55%, 57%, 38%, 63%, 14% and 35% people do not have access to an improved sanitary toilet in Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur and Sylhet Division respectively. Therefore, except Barisal and Khulna division, in all divisions have a relatively higher percentage of individuals who do not have access to an improved toilet facility. Therefore, the condition is most severe in Dhaka and least severe in Rangpur Division. The quintile wise variation is also statistically significant ($p < 0.01$) in all cases. Data confirms that in all divisions, poor incomes groups' access to the facility is the poorest. Regarding the overall scenario, we find 44.09% people do not have access to improved toilet and the quintile wise variation is also statistically significant.

5. Regression result

Table 6 (see Appendix) presents the regression results of Probit regression (showing the marginal impact) considering *Disease* (=1, if the person affected by disease and 0, otherwise) as the Dummy Dependent Variable and including all the relevant explanatory and control variable. We have a two folded objective—besides investigating the marginal impact of the determinants on the probability of the incidence of disease for the overall sample; we try to find out whether the probability varies within and across different income quintiles. Dividing each observation in terms of income quintile we have conducted Probit regression to each quintiles with the same model specification. This allows us to show in each quintile how the access to safe and improved water and sanitation system influences the probability of the disease prevalence.

A set of post-diagnostic tests were performed in this study. LR Chi-square scores of the overall regression and the quintile wise regressions are large and statistically significant (at 1% and 5% level of significance), which confirms that all the slope coefficients are simultaneously significant (see Table 6 in the Appendix). Besides, the Pseudo R^2 values show that all the models are well fitted, although, R^2 is not a good measure of goodness of fit in binary models (Gujarati and Sangeetha, 2007). Ramsey RESET test (1969) was conducted on the model to test whether the model is correctly specified. Test score confirms that we cannot reject the null hypothesis that the model is correctly specified (p-value is 0.1470). Breusch-Pagan test (1979) confirms that we cannot reject the null hypothesis of constant variance, i.e., indicating no heteroskedasticity in the model (p-value is 0.3930). To check multicollinearity in the model, we have obtained the VIF (Variance Inflating Factor) values of each variable. However, none of the VIF scores was greater than 3 (i.e., below the threshold value of 5) indicating that there is no multicollinearity in the model. For further confirmation, we have obtained the covariance matrix of the parameter estimates of the model (using *estat vce* command in STATA) which also shows that none of the correlation values are higher than one, which indicates that there is no multicollinearity in the model (all the test scores can be provided on request).

Turning to the regression results, column 1 of Table 6 shows the marginal impact for the overall sample and column 2 -5 shows the quintile-wise marginal impacts (starting from the poorest to the richest quintile). We start the result analysis with the overall sample. The coefficient of *Water* is -0.00624, which implies that the probability of getting affected by water-borne diseases is 0.00624 percentage point lower for the individuals who have access to safe water compared to those who does not, ceteris paribus. The coefficient is very weakly significant (at 10% level of significance). The probable reason behind this may be only a very small number of individuals have replied that they do not have the access to safe water. In rural areas of Bangladesh, Tube wells are the main source which are widely available and treated as a public good. This is probably why the variable failed to show a significant impact of the probability of disease.

Regarding our second explanatory variable – *Sanitation*, results in column 1 shows that the marginal impact of access to sanitary latrine on the probability of disease prevalence is - 0.0056 and which is highly significant (as $p < 0.001$). This implies better access to sanitary toilet decreases the probability of getting affected by sanitation and hygiene contaminated diseases by 0.56% compared to those who do not have this facility. The result goes in line with the literature (e.g., Sultana et al. 2013; Huda et al. 2012).

Analysing the predisposing features of disease prevalence i.e., socio-demographic features that influences the probability of disease as defined by (Anderson 1995) our study finds the following outcomes. Result in column 1 shows that Patient's age is positively but insignificantly associated with disease prevalence meaning that elder people are more prone to water and sanitation contaminated disease. Regarding sex of the individual, the study finds that there is a gender biasness in disease prevalence as the coefficient of the variable *sex of the patient* (=1 if male) is negative and significant at 1% level of significance (coefficient is - 0.0076). This implies male have a lower probability of getting affected than their counterpart. Literature claims that women are more likely to report ill health than men as women are more involved in household cooking and

cleaning activity they are more likely to be vulnerable to such water and sanitation contaminated diseases (Wang et al. 2013). The coefficient of the variable *education* is -0.00114 which is also highly significant level ($p < 0.01$). This implies with one more year of education of the patient, the probability of disease prevalence decreases by 0.11%, *ceteris paribus*. This is expected as with education, the health consciousness increases and high education usually generate a higher level of income. As a result, it enables individual's economic capability and increases the access to improved sanitation and safe water facilities. Moreover, no religious biasness in the probability of disease prevalence is found in this study as the sign of the coefficient of the dummy variable *religion* (=1 if Islam) is positive but not statistically significant.

Mother's age positively related to the probability of disease occurrence, on the other hand, family head's age is negatively associated with the probability; neither of them is statistically significant. Regarding parent's education we find that both mother's level of education (years of education) is positively associated with the probability of disease occurrence in the lower income groups. Head's level of education is positively but not significantly associated with disease prevalence. Hence, with parent's level of education the probability of disease prevalence increases, which is contradictory to the conventional relationship. However, the average level of education is very low (2.41 years for mother and 3.08 years for father) therefore, an increase in education fails to the conventional relationship with disease prevalence.

Neither of the household characteristic variables are statistically significant for the overall sample. Among the enabling factors, we find that earning status of the head and the mother is negatively associated with the probability of disease prevalence implying that earning parent's children have a lower probability of getting affected by water and sanitation contaminated disease. The coefficient of the variable is not significant though. Among the other enabling factors, households receiving benefits from social safety nets are more exposed to the disease prevalence as we find that the coefficient is statistically significant ($p < 0.05$). This is due to the fact that these families are the most vulnerable one in terms of income. On the other hand, the coefficient of total landholding by the household is negative, meaning households with more lands have less probability to be affected by those diseases. Although, the magnitude of the marginal effects of landholding is not significant.

The study also included regional dummies (six Divisions are including keeping Dhaka as the base category). Result shows that Barisal, Chittagong, Khulna and Rangpur have significantly higher disease prevalence rate than Dhaka Division ($p < 0.05$). The other two Divisions, Sylhet and Rajshahi have lower prevalence rate than Dhaka.

5.1 Does the impact vary across different income groups?

To investigate the relationship more elaborately, the study conducts Probit analysis on different income quintiles to show whether the impact of the determinants vary across different income groups. Regression results (the marginal impact) are shown from column 2-6 of Table 6 (see appendix), using the same specification of the model. Results show that access to safe water is negatively associated with the probability of disease prevalence for all income quintiles however, the coefficient is weakly statistically significant in the 2nd, 3rd, 4th, and the 5th quintile (at 10% level of significance). This result

indicates that for lower income group access to safe water does not influence the probability of disease prevalence but for a higher income group it decreases the probability of being affected by water-borne disease.

Considering the second indicator, we find that access to improved latrine is negatively and significantly associated with the probability of disease in the lower three quintiles (at 1% and 5% level of significance respectively) and weakly significant in the upper two quintiles (i.e., at 10% level of significance). This suggests that by improving the sanitary latrine facility it is possible to reduce the disease prevalence significantly especially in the lower income groups.

None of the quintiles show significant results for patient's age. All the quintiles show positive estimates except the poorest quintile, where the coefficient is negative indicating that in the poorest quintile young people are more vulnerable to diseases. However, in the other quintiles elder people are more vulnerable to disease prevalence. The study finds that gender biasness remains significant ($p < 0.01$) in each income quintiles implying women are more vulnerable to such diseases compared to their counterpart. Patient's education attainment is negatively and significantly (at 1% level of significance) associated with the probability of disease occurrence in all quintiles, which is expected. This implies that for all income groups increase in patient's years of education reduces the likelihood of disease prevalence. However, there is no significant religious biasness in the quintile wise variation. Regarding parent's age, the study finds that mother's age is positively associated with disease prevalence in all income groups (weakly significant association in 2nd and 3rd quintile). However, household head's age is negatively associated with disease prevalence and results shows that the association is significant in 2nd, 3rd and in the richest quintile (at 5%, 10% and 10% level of significance, respectively). Regarding education we find that mother's education is positively related with disease prevalence and highly significant in the poorest quintiles (at 1% level of significance). However, because of a very low level of educational attainment we ignore this result. Head's level of education, however shows positive insignificant association, except in the richest quintile, where the association is rather significant ($p < 0.05$).

Household density is positively associated with the probability of disease prevalence in poorest and 4th quintile, but the coefficients are not significant. In the rest of the quintiles, the relation is negative though insignificant. Among the other household dwelling features, *separate dining* and *separate kitchen* is negatively associated with the probability of disease occurrence in each income quintile. The coefficient of *separate kitchens* variable is statistically significant at 5% level of significance in all income quintiles implying that it has a significant influence on the probability of water and sanitation borne disease prevalence. However, the result is not significant for *separate dining* though. Access to electricity is negatively associated with the probability of disease occurrence for the middle-income groups. Access to electricity increases the likelihood of owning electronic media which makes the households better informed about health and hygiene-related issues which increases the probability of disease prevention. Although, the association is statistically significant (at 5% level of significance) for the 2nd poorest income group and very weakly significant in the 3rd and richest quintile (at 10% level of significance).

Among the enabling factors, earning status of the individual and the mother does nor not doesn't influence the probability significantly throughout the quintiles. Though in all quintiles (except the poorest), they exhibit negative relation indicating earning individuals and individuals with earning mother have less probability of getting affected by water and sanitation related diseases. On the other hand, households who are included in any social safety net program (i.e., receives government transfers) have a higher probability of disease prevalence in all income groups (except the households in the richest quintile) compared to those who are not included in the program. However, the association is only significant in the poorest quintile ($p < 0.05$). This is logical as only the poor and marginalised people are included in such programs and because of their lack of financial strength they are relatively more vulnerable to such diseases. Again, in all the quintiles except the richest quintile, with a higher amount of land holding, the probability of disease occurrence decreases. Though, none of the coefficients is statistically significant. Therefore, landholding fails to show any significant association with the likelihood of disease prevalence. Considering the regional variation, the study finds that in Rangpur and Khulna all the income groups have significantly higher disease prevalence rate whereas in other divisions income group wise variation is not significant.

6. Conclusion

This study uses the national survey dataset (HIES-2010) to investigate the effects of access to safe water and improved sanitation facilities along with some predisposing and enabling factors on the probability of water, sanitation and hygiene related disease occurrence. The cross-sectional study focuses on rural Bangladesh, where the water and sanitation contaminated diseases are the highest prevalent. Investigating marginal effects of the determinants of disease prevalence, the study finds that access to improved latrine facility significantly influences the probability of disease prevalence. The impact is more significant for the lowest income groups compared to higher-income quintiles. Therefore, increasing the sanitation facility especially to the lower-income group, will significantly decrease the disease prevalence. However, the other indicator, access to safe water fails to show any significant impact on the overall sample though the influence becomes weakly significant in the highest quintile.

Among the other variables, individual's level of education plays a significant role to overcome the disease burden. The study also finds that female patients are more likely to be affected by disease compared to their counterparts; however, the study finds no evidence of children getting affected more. Also, there are significant variations in the marginal effects across different income quintiles in terms of both directions and magnitude. The study finds some contrasting results, for instance, mother's level of education and the family head's level of education does not play any role in determining the outcome. Enabling factors like earning status, landholding and access to social benefit do not have any significant effect in reducing disease occurrence. However, findings show that predisposing factors play a more significant role than the enabling factors in influencing the disease prevalence. Access to a separate kitchen and electricity plays a more important role than other variables.

Descriptive results of this study reveal that availability of the facilities and the distribution of the probability of getting affected significantly vary across divisions. This

variation should be taken into observation while creating a national health policy for the country. However, self-reported illness is often overrated in rural areas, and it may have affected the outcome of the study to some extent which can be considered as a limitation of this investigation. Moreover, this study only concentrated on the rural setting; therefore, future studies can focus on urban areas and make a comparative analysis. Irrespective of such a limitation, this empirical study makes a novel contribution to the literature by investigating the determinants of environmental health outcomes and how they vary across different income groups and regions of a country.

References

- Abubakar, R. I. 2017. Access to Sanitation Facilities among Nigerian Households: Determinants and Sustainability Implications, *Sustainability*, 9: 547-564.
- Adams, J.U. 2016. Drinking water safety, *CQ researcher*, 26:577-600.
- Akter, T., Johura, F.T., Akter, F., Chowdhury, T.R., Mistry, S.K., Dey, N.C. and Rahman, M. 2015. The Status of Water, Sanitation and Hygiene in Rural Bangladesh. Research Monograph Series No.63. BRAC Research and Evaluation Division. http://www.bracuk.net/wp-content/uploads/2015/11/Monograph_60.pdf. retrieved on 23.7.2019.
- Arnold, B. F., Null, C., Luby, S.P., Unicomb, L., Stewart, C.P., Dewey, K.G., Ahmed, T. 2013. Cluster-randomised controlled trials of individual and combined water, sanitation, hygiene and nutritional interventions in rural Bangladesh and Kenya: the WASH Benefits study design and rationale, *BMJ Open*, 3.
- Andersen, R.M. 1995. Revisiting the Behavioral Model and Access to Medical Care: Does it Matter? *Journal of Health and Social Behavior*, 36:1-10.
- Barnard, S., Routray, P., Majorin, F., Peletz, R., Boisson, S., Sinha, A. and Clasen. T. 2013. Impact of Indian Total Sanitation Campaign on Latrine Coverage and Use: A Cross-Sectional Study in Orissa Three Years following Programme Implementation, *PLoS ONE*, 8 (8).
- Benjamin-Chung, J., Sultana, S., Halder, A.K., Ahsan, M.A., Arnold, B.F., Hubbard, A.E., Unicomb, L., Luby, Colford, J.M. 2017. Scaling Up a Water, Sanitation, and Hygiene Program in Rural Bangladesh: The Role of Program Implementation, *American Journal of Public Health*, 107: 694– 701.
- Breusch, T. S., A. R. Pagan. 1979. A simple test for heteroscedasticity and random coefficient variation. *Econometrica* 47: 1287-1294.
- Briggs, David J & World Health Organization. Occupational and Environmental Health Team. 1999. Environmental health indicators: framework and methodologies / prepared by David Briggs. World Health Organization. <http://www.who.int/iris/handle/10665/66016>. Retrieved on 20.8.2018.
- Briend, A. 1990. Is diarrhoea a major cause of malnutrition among the under-fives in developing countries? A review of available evidence, *European Journal of Clinical Nutrition*, 44:611-628.
- Chaudhuri, S., Roy, M. 2017. Rural-urban spatial inequality in water and sanitation facilities in India: A cross-sectional study from household to national level, *Applied Geography*, 85: 27–38.
- Dangour, A.D., Watson, L., Cumming, O., Boisson, S., Che, Y., Velleman, Y., Cavill, S., Allen, E. & Uauy, R. 2013. Interventions to improve water quality and supply, sanitation and hygiene practices, and their effects on the nutritional status of children, in: *The Cochrane*

- Collaboration (Ed.), *Cochrane Database of Systematic Reviews*. John Wiley & Sons, Ltd, Chichester, UK
- dos Santos, R. and Gupta, J. 2017. Pro-poor water and sanitation: operationalising inclusive discourses to benefit the poor, *Current Opinion in Environmental Sustainability*, 24: 30–35.
- Duflo, E., Greenstone, M., Guiteras, R. & Clasen, T., 2015. Toilets can work: Short and medium run health impacts of addressing complementarities and externalities in water and sanitation. National Bureau of Economic Research. <https://www.nber.org/papers/w21521> retrieved on 11.07.2019.
- Engell, R.E. and Lim, S.S. 2013. Does clean water matter? An updated meta-analysis of water supply and sanitation interventions and diarrhoeal diseases, *The Lancet*, 381(S44).
- Gertler, P., Shah, M., Alzua, M.L., Cameron, L., Martinez, S., and Patil, S. 2015. How Does Health Promotion Work? Evidence From The Dirty Business of Eliminating Open Defecation. NBER Working Paper no. 20997.
- Guiteras, R., Levinsohn, J., and Mobarak A.M. 2015. Encouraging sanitation investment in the developing world: A cluster-randomised trial. *Science* no. 348 (6237):903-906.
- Gujarati, D.N., Sangeetha, 2007. *Basic Econometrics*, Tata McGraw-Hill. 4/e.
- Huda, T.M.N., Unicomb, L. and Johnston R.B. 2012. Interim evaluation of a large scale sanitation, hygiene and water improvement programme on childhood diarrhea and respiratory disease in rural Bangladesh, *Social Science & Medicine*, 75:604–11.
- Humphrey, J.H. 2009. Child undernutrition, tropical enteropathy, toilets, and handwashing, *The Lancet*, 374: 1032 – 1035.
- Liu A., Li Q. and Friberg I.K. 2013. Estimating the Child Health Equity Potential of Improved Sanitation in Nepal, *BMC Public Health*, 13:1-8.
- Murray, C. J. L. and Chen, L. C. 1992. Understanding morbidity change, *Population & Development Review*, 18: 481-503.
- NACCHO and CDC. 2000. A strategic approach to community health improvement: MAPP. Available online at http://mapp.naccho.org/MAPP_Home.asp.
- Patil, S.R., Arnold, B.F., Salvatore, A.L., Briceno, B., Ganguly, S., Colford, J.M. and Gertler, P.J. 2014. The Effect of India's Total Sanitation Campaign on Defecation Behaviors and Child Health in Rural Madhya Pradesh: A Cluster Randomized Controlled Trial, *PLoS Medicine*, 11:e1001709.
- Pattanayak, S. K., Poulos, C., Yang, J.C. and Patil, S. 2010. How valuable are environmental health interventions? Evaluation of water and sanitation programmes in India, *Bulletin of the World Health Organization*, 88 (7):535-542.
- Prüss-Ustün, A., Bartram, J., Clasen, T., Colford, J.M., Cumming, O., Curtis, V., Bonjour, S., Dangour, A.D., De France, J., Fewtrell, L., Freeman, M.C., Gordon, B., Hunter, P.R., Johnston, R.B., Mathers, C., Mäusezahl, D., Medlicott, K., Neira, M., Stocks, M., Wolf, J. & Cairncross, S. 2015. Burden of disease from inadequate water, sanitation and hygiene in low- and middle-income settings: a retrospective analysis of data from 145 countries, *Tropical Medicine & International Health*, 19:894–905.
- Ramsey, J. B. 1969. Tests for specification errors in classical linear least-squares regression analysis. *Journal of the Royal Statistical Society, Series B* 31: 350-371.
- Rana, A. 2009. Effect of water, sanitation and hygiene Intervention in reducing self-reported waterborne diseases in rural Bangladesh. Bangladesh: BRAC.
<https://www.semanticscholar.org/paper/Effect-of-Water-%2C-Sanitation-and-Hygiene-in-in-Rana/9e9c5081ee290f2ebce79669c97390f7bcc60258>. Retrieved on 22.9.2018.

- Sultana, R., Mondal, U.K. and Rimi, N.A. 2013. An improved tool for household faeces management in rural Bangladeshi communities, *Tropical Medicine & International Health*, 18:854–860.
- UN.2016. The Sustainable Development Goals Report. <https://unstats.un.org/sdgs/report/2016/>
- Wang, Y., Hunt, K. and Nazareth, I. 2013. Do men consult less than women? An analysis of routinely collected UK general practice data, *BMJ Open* 3:e003320.
- WHO 2017. Global Nutrition Report. World Health Organisation.
<http://www.who.int/nutrition/globalnutritionreport/en/> retrieved on 13.10.2018.
- WHO. 2017. Progress on drinking water, sanitation and hygiene. Joint Monitoring Programme 2017 update and SDG baselines.
- WWAP 2015. The United Nations World Water Development Report 2015: Water for a Sustainable World. Paris, UNESCO.
<http://www.unesco.org/new/en/natural-sciences/environment/water/wwap/wwdr/2015-water-for-a-sustainable-world/> retrieved on 13.10.2018.

APPENDIX

Table 3: Regional variation in diseases by income quintiles

| Regions | Disease | Income quintiles | | | | | Total Obs. | Chi-square |
|------------|-----------|------------------|-------|-------|-------|---------|------------|------------|
| | | Poorest | 2nd | 3rd | 4th | Richest | | |
| Barisal | Yes | 32.47 | 28.57 | 20.78 | 10.39 | 7.79 | 77 | 7.0451 |
| | otherwise | 26.82 | 23.13 | 17.72 | 16.63 | 15.70 | 3,031 | |
| Chittagong | Yes | 19.02 | 10.43 | 19.02 | 20.25 | 31.29 | 163 | 5.2430*** |
| | otherwise | 18.51 | 15.77 | 18.85 | 21.51 | 25.36 | 7,039 | |
| Dhaka | Yes | 17.93 | 26.21 | 21.38 | 18.62 | 15.86 | 145 | 3.9953 |
| | otherwise | 19.3 | 19.91 | 20.98 | 18.68 | 21.13 | 10,038 | |
| Khulna | Yes | 21.13 | 21.83 | 28.87 | 14.79 | 13.38 | 142 | 10.8083** |
| | otherwise | 18.6 | 20.88 | 19.36 | 19.51 | 21.65 | 4,527 | |
| Rajshahi | Yes | 22.13 | 22.95 | 22.95 | 20.49 | 11.48 | 122 | 6.8704 |
| | otherwise | 18.49 | 20.71 | 20.71 | 18.34 | 21.75 | 3,917 | |
| Rangpur | Yes | 23.75 | 26.25 | 18.75 | 12.5 | 18.75 | 80 | 4.3003 |
| | otherwise | 18.52 | 20.47 | 21.31 | 19.36 | 20.33 | 3,749 | |
| Sylhet | Yes | 21.71 | 17.39 | 20.29 | 18.67 | 21.18 | 69 | 9.2383* |
| | otherwise | 20.03 | 21.4 | 21.12 | 17.83 | 19.62 | 3,602 | |

***p<0.01, **p<0.05, *p<0.1

Table 4: Variation in access to safe water across regions and income quintiles

| Regions | Access to safe water | Income Quintiles | | | | | Total obs. | Chi square |
|------------|----------------------|------------------|-------|-------|-----------------|---------|------------|------------|
| | | Poorest | 2nd | 3rd | 4 th | Richest | | |
| Barisal | Yes | 98.19 | 97.22 | 97.71 | 98.53 | 90.34 | 2,991 | 88.85*** |
| | No | 1.81 | 2.78 | 2.29 | 1.47 | 9.66 | 117 | |
| Chittagong | Yes | 79.84 | 83.52 | 83.94 | 82.24 | 79.77 | 5,888 | 14.77** |
| | No | 20.16 | 16.48 | 16.06 | 17.76 | 20.23 | 1,314 | |
| Dhaka | Yes | 95.07 | 92.16 | 92.66 | 92.63 | 92.82 | 8,735 | 16.23** |
| | No | 4.93 | 7.84 | 7.34 | 7.37 | 7.18 | 650 | |
| Khulna | Yes | 83.7 | 86.39 | 86.32 | 89.6 | 84.01 | 4,010 | 15.38** |
| | No | 16.3 | 13.61 | 13.68 | 10.4 | 15.99 | 659 | |
| Rajshahi | Yes | 97.41 | 98.66 | 98.86 | 97.99 | 97.75 | 3,964 | 6.74 |
| | No | 2.59 | 1.34 | 1.14 | 2.01 | 2.25 | 75 | |
| Rangpur | Yes | 100 | 98.05 | 99.62 | 98.2 | 100 | 3,798 | 35.80*** |
| | No | 0 | 1.95 | 0.38 | 1.8 | 0 | 31 | |

| Regions | Access to safe water | Income Quintiles | | | | | Total obs. | Chi square |
|---------|----------------------|------------------|-------|-------|-----------------|---------|------------|------------|
| | | Poorest | 2nd | 3rd | 4 th | Richest | | |
| Sylhet | Yes | 86.74 | 90.51 | 93.79 | 97.51 | 98.08 | 3,444 | 109.89*** |
| | No | 13.26 | 9.49 | 6.21 | 2.49 | 1.92 | 227 | |
| Overall | Yes | 83.96 | 87.24 | 87.52 | 83.63 | 86.94 | 32,830 | 11.2831** |
| | No | 16.04 | 12.76 | 12.48 | 16.37 | 13.06 | 3,073 | |

***p<0.01, **p<0.05, *p<0.1

Table 5: Variation in access to improved toilets across regions and income quintiles

| Regions | Access to latrine | Income Quintiles | | | | | Total obs. | Chi square |
|------------|-------------------|------------------|-----------------|-------|-------|---------|------------|------------|
| | | Poorest | 2 nd | 3rd | 4th | Richest | | |
| Barisal | Yes | 78.73 | 73.22 | 74.85 | 83.33 | 88.06 | 2,453 | 54.62*** |
| | No | 21.27 | 26.78 | 25.15 | 16.67 | 11.94 | 655 | |
| Chittagong | Yes | 28.33 | 33.08 | 38.27 | 45.73 | 64.35 | 3,171 | 183.58*** |
| | No | 71.67 | 66.92 | 61.73 | 54.27 | 35.65 | 4,031 | |
| Dhaka | Yes | 31.97 | 38.86 | 45.01 | 51.68 | 57.74 | 4,014 | 199.73*** |
| | No | 68.03 | 61.14 | 54.99 | 48.32 | 43.26 | 5,371 | |
| Khulna | Yes | 54.5 | 57.53 | 52.67 | 63.27 | 77.41 | 2,855 | 160.26*** |
| | No | 45.5 | 42.47 | 47.33 | 36.73 | 22.59 | 1,814 | |
| Rajshahi | Yes | 24.74 | 25.57 | 27.78 | 37.67 | 64.48 | 1,480 | 392.52*** |
| | No | 75.26 | 74.43 | 72.22 | 62.33 | 35.52 | 2,559 | |
| Rangpur | Yes | 8.96 | 7.46 | 7.55 | 16.48 | 39.1 | 544 | 390.27*** |
| | No | 91.04 | 92.54 | 92.45 | 83.52 | 60.9 | 3,285 | |
| Sylhet | Yes | 30.00 | 23.06 | 33.01 | 43.01 | 61.86 | 1,313 | 224.661*** |
| | No | 70.00 | 76.94 | 66.99 | 56.99 | 38.14 | 2,358 | |
| Overall | Yes | 33.11 | 36.85 | 38.11 | 48.73 | 63.73 | 20,073 | 0.0017*** |
| | No | 66.89 | 63.15 | 61.89 | 51.27 | 36.27 | 15,830 | |

***p<0.01, **p<0.05, *p<0.1

Table 6: Regression results of the Probit model

| Variables | Dependent Variable: <i>Disease</i> (<i>Disease</i> =1 if individual is affected by water or sanitation borne diseases) | | | | | |
|------------------------------|--|-------------|-------------------------|-----------------|-------------|-------------|
| | Overall | poorest | 2 nd poorest | 3 rd | 4th | richest |
| Explanatory variables | | | | | | |
| Water | -0.00624* | -0.00764 | -0.0162* | -0.00647* | -0.00643* | 0.000167* |
| (=1, having access) | (0.00350) | (0.00756) | (0.00929) | (0.00845) | (0.00768) | (0.00595) |
| Sanitation | -0.00565*** | -0.0120*** | -0.00952** | -0.00274** | -0.00189* | -0.00146* |
| (=1, having access) | (0.00188) | (0.00377) | (0.00343) | (0.00423) | (0.00383) | (0.00415) |
| Control variables: | | | | | | |
| Individual's age | 5.76e-06 | -0.000102 | 2.66e-05 | 2.50e-05 | 3.45e-05 | 7.44e-05 |
| | (5.35e-05) | (0.000116) | (0.000107) | (0.000120) | (0.000110) | (0.000111) |
| Sex | -0.00765*** | -0.00730*** | -0.00377** | -0.0109** | -0.00461** | -0.0102** |
| (=1, if Male) | (0.00202) | (0.00402) | (0.00386) | (0.00456) | (0.00428) | (0.00453) |
| Level of education | -0.00114*** | -0.00127*** | -0.00072*** | -0.00201*** | -0.00063*** | -0.00125*** |
| (in years) | (0.000269) | (0.000646) | (0.000550) | (0.000672) | (0.000511) | (0.000493) |
| Religion | 0.00269 | 0.00944* | 0.000781 | 0.00153 | 0.000739 | 0.00487 |
| (=1, is Islam) | (0.00241) | (0.00440) | (0.00509) | (0.00549) | (0.00529) | (0.00474) |
| Mother's age | 0.000231 | 0.00152 | 0.000130* | 0.00071* | 0.000733 | 0.000544 |
| | (0.000212) | (0.000494) | (0.000381) | (0.000468) | (0.000432) | (0.000501) |
| Mother's education | 0.000927*** | 0.00108*** | 0.00115*** | 0.00166** | 0.000290* | 0.000211* |
| (in years) | (0.000322) | (0.000681) | (0.000623) | (0.000767) | (0.000690) | (0.000653) |
| Head's age | -0.000257 | -0.00136 | -0.000182** | -0.000491* | -0.000342 | -0.000733* |
| | (0.000184) | (0.000439) | (0.000315) | (0.000393) | (0.000375) | (0.000454) |
| Head's education | 0.000543** | 0.000035 | 0.000983 | 0.000554 | 0.000341 | 0.000291** |
| (in years) | (0.000274) | (0.000599) | (0.000531) | (0.000664) | (0.000548) | (0.000576) |
| Household density | 0.00137 | 0.0109 | -0.0129 | -0.00471 | 0.00217 | -0.00300 |
| (members per room) | (0.00362) | (0.0100) | (0.00959) | (0.00916) | (0.00715) | (0.00609) |
| Separate dining room | -0.00322 | -0.00632 | -0.00696 | -0.00164 | -0.000469 | -0.00478 |
| (=1, if yes) | (0.00269) | (0.00579) | (0.00515) | (0.00753) | (0.00550) | (0.00427) |
| Separate kitchen | -0.00313 | -0.0135*** | -0.000791** | -0.00210** | -0.00597** | -0.00247*** |
| (=1, if yes) | (0.00213) | (0.00506) | (0.00382) | (0.00438) | (0.00476) | (0.00479) |
| Access to electricity | -0.00317* | -0.00712 | -0.00260** | -0.00729* | -0.00240 | -0.00974* |
| (=1, if yes) | (0.00180) | (0.00451) | (0.00341) | (0.00395) | (0.00375) | (0.00440) |
| Earning status | -0.00261 | -0.00164 | -0.00177 | -0.00306 | -0.00698 | -0.00244 |
| (=1, if earner) | (0.00245) | (0.00534) | (0.00512) | (0.00540) | (0.00475) | (0.00533) |
| Mother's earning status | -0.000758 | 0.00887 | -0.00222 | -0.00022 | -0.00247 | -0.00316 |
| (=1, if earner) | (0.00292) | (0.00465) | (0.00534) | (0.00635) | (0.00730) | (0.00580) |
| Included in safety net | 0.00457** | 0.0126** | 0.000215 | 0.00288 | 0.0195 | -0.00513 |

| Dependent Variable: Disease | | | | | | |
|--|------------|------------|-------------------------|-----------------|------------|------------|
| <i>(Disease=1 if individual is affected by water or sanitation borne diseases)</i> | | | | | | |
| Variables | Overall | poorest | 2 nd poorest | 3 rd | 4th | richest |
| (=1, if yes) | (0.00233) | (0.00526) | (0.00413) | (0.00488) | (0.00532) | (0.00520) |
| Total land holding | -2.29e-06 | 1.87e-05 | 8.55e-06 | 3.49e-06 | 1.68e-05 | -1.42e-05 |
| (in decimal) | (5.15e-06) | (2.05e-05) | (1.61e-05) | (1.41e-05) | (1.05e-05) | (7.86e-06) |
| region1 dummy | 0.0103** | 0.0283** | 0.0284* | 0.0126* | 0.00701 | 0.00796 |
| (Barisal Division) | (0.00468) | (0.0122) | (0.0130) | (0.0117) | (0.00672) | (0.00672) |
| region2 dummy | 0.00816** | 0.00310 | 0.00159* | 0.0107* | 0.00709 | 0.0153* |
| (Chittagong Division) | (0.00326) | (0.00607) | (0.00571) | (0.00798) | (0.00677) | (0.00716) |
| region4 dummy | 0.0155*** | 0.0201** | 0.0122* | 0.0162** | 0.0140** | 0.0175** |
| (Khulna Division) | (0.00400) | (0.0100) | (0.00822) | (0.00892) | (0.00815) | (0.00897) |
| region5 dummy | 0.0148*** | 0.0106** | 0.0131** | 0.0302*** | 0.0173** | 0.00509* |
| (Rangpur Division) | (0.00416) | (0.00836) | (0.00803) | (0.0117) | (0.00953) | (0.00779) |
| region6 dummy | 0.00276 | 0.00326 | -0.00123 | 0.00656 | 0.0134 | 0.00131 |
| (Rajshahi Division) | (0.00338) | (0.00575) | (0.00579) | (0.00851) | (0.00907) | (0.00750) |
| region7 dummy | 0.00291 | -0.00482 | 0.00558 | -0.00566 | -0.00638 | -0.03007 |
| (Sylhet Division) | (0.00375) | (0.00612) | (0.00737) | (0.00929) | (0.00602) | (0.0151) |
| Observations | 29,410 | 6,020 | 6,047 | 5,969 | 5,820 | 5,554 |
| LR Chi square | 114.38*** | 73.14*** | 38.37** | 39.14** | 49.34*** | 54.09*** |
| Pseudo R-square | 0.5180 | 0.5527 | 0.4887 | 0.4145 | 0.4845 | 0.5118 |

Standard errors in parentheses, ***p<0.01, **p<0.05, *p<0.1

Environmental Health Analysis of Industrial Area: A Case Study on Urban Area, Khulna, Bangladesh

Tahsina Zarin^{*}
Md. Tanvir Hossain^{**}
Md. Nazmul Haque^{***}

Abstract: Environment is anything that instantly surrounds an object and has a direct influence on it. The aim of this research is to analyze the current scenario of softscape and Hardscape features along with the temporal change over a period of 10 years. We collect primary data from the field survey and Landsat 7 and 8 raster data have been used for different analysis in this study. Image classification, Normalized Difference Vegetation Index (NDVI), Normalized Difference Built Index (NDBI), Normalized Difference Water Index (NDWI), Land Surface Temperature (LST) etc. remote sensing tools are used in this project for analyzing current scenario of the softscape and hardscape features of the environment. This study makes a decision on the point that vegetation coverage has been reduced by 33.28% within the time frame of 10 years where the health of the vegetation is increased by 0.11 in 2014 but it reduces by same amount in 2019. Though there is a strong relationship between NDBI and LST, for imbalance situation between softscape and hardscape features of the area, LST has reduced with the increase of NDBI value. Besides, the pollution effects in adjacent rivers are dipping as a result of reducing industrial activities in that area. Finally, for any development in this area, socio-economic conditions and land use of the area must be considered consciously.

Keywords: Eco-system, Environment, Pollution, Vegetation, Environment Profiling

1. Introduction

Environment is a platform where humans are born, raised, and live. It is simply the part of human existence that can't even be thought of avoiding. More precisely, Environment is anything that surrounds an object instantly and exerts a direct influence on it (Gisbert, 2010). In today's fast developing world protecting the environment is a crying need as it depends on our entire existence. The word relevant to climate is also very important to human life, and that is Ecosystem. An ecosystem is a population of living organisms that communicate as a group, together with the non-living components of their environment.

Environmental policy is the method of preparing sustainable development on the environmental basis (Ellis, 2010). It can also describe as the theory and practice of making good, interrelated decisions about the natural environment, working landscapes, public health, and built environment. Green planning is carried out primarily by the primary planning departments through different agencies (Daniel, 2009). Environmental pollution is characterized as contamination of the earth / atmosphere system's physical and biological components in such a way that normal environmental processes are

* Under Graduate Student, Department of Urban and Regional Planning, Khulna University of Engineering & Technology (KUET), Bangladesh, email: zarin1617002@stud.kuet.ac.bd

** Under Graduate Student, Department of Urban and Regional Planning, Khulna University of Engineering & Technology (KUET), Bangladesh, email: hossain1617003@stud.kuet.ac.bd

*** Assistant Professor, Department of Urban and Regional Planning, Khulna University of Engineering & Technology (KUET), Bangladesh, email: nhaque13@urp.kuet.ac.bd

adversely affected (Iyyanki & Manickam, 2017). Pollutants may be naturally occurring substances or forces, but when reaching natural levels, they are called pollutants. Any use of natural resources at a rate higher than the capacity of nature to recover itself can result in air, water and land pollution. Ecosystem is a biological system that consists of all the species present in a given physical environment. The species communicate with it, with each other (Tsujimoto et al., 2017). It can be seen as the complex interactions between ecosystem biotic and abiotic elements that include material cycles and energy flow as broad terms (Lyon & Brigham, 2005). An Ecological Profile can be described as a more detailed replacement of the usual socio-economic profile, giving equal coverage to the physical, biological, socio-economic, cultural and built environments.

Industry profiles are in-depth documents that provide insight into an industry from where it started to where it appears to be going. Environmental health is the public health division which is concerned with all aspects of the natural and built environment that influence human health. Industries create various kinds of pollution like air pollution, water pollution, noise pollution etc. which are very much harmful to the environment. People suffer various kinds of diseases like respiratory illness, brain and nervous system effect, water borne disease, deafness etc.

Climate and biodiversity play a major role in human life, or in other words human life relies entirely on these. But the inventions which are also responsible for man's better life are responsible for environmental and biodiversity destruction. Each development has more or less an environmental impact. Therefore, managing these impacts is very important to ensure a living Earth state. Understanding the components of these is very important for maintaining or regulating the climate and ecosystem. Bangladesh is a rapidly developing country that hopes to very soon become a developed country. The environment and the ecosystem are at risk of being disrupted at a high rate in this process of development and this may pose a threat to the country's population. Environmental profiling based on the industrial area and its change of ecosystem and pollution effect has not been assessed yet in Khulna city. The scope of this study is to differentiate short-term and long-term plans can be built with the current environmental situation. Besides the atmospheric quality can be enhanced by reducing the emissions and taking measurement of the source of pollution. The objective of this research is to analyze the condition of the softscape and hardscape environmental features of the study area over a period of time. Data used in this study might be obsolete and have some inaccuracy as environment is a continuous changing process.

2. Methods and Materials

2.1. Study Area

Ward 7 and 8 among 31 wards of Khulna City Corporation (KCC), Bangladesh, is selected as a study area in this project that is located in between 22°50' and 22°52' north latitudes and in between 89°31' and 89°34' east longitudes. Ward 07 has an area of 118.6 acre and ward 08 has 234.75 acre with a population of 14800 and 18550 respectively. As in figure 1, Bhairab river has passed on one side of the study area and the area consists of many industries and colonies of workers from that industry. This area is highly trend to pollution from the industries and low-income people from the industries lives there.

2.2. Methods

To obtain the study objective sequential and systematic steps are adopted. The initial reconnaissance survey has done to find out the existing environmental condition of the area. Secondary data has been collected by reviewing different articles and satellite has been downloaded from the USGS in the interval of 5 years from 2019. After data collection from different sources the environmental profiling has been done based on the data.

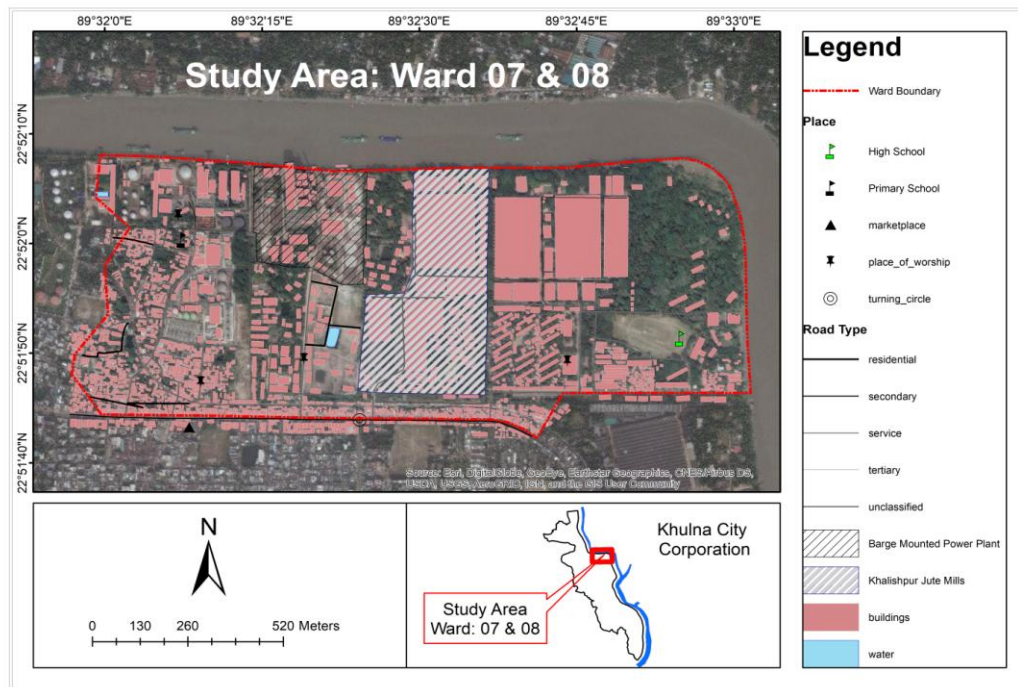


Figure 1: Study Area: Ward 07 & 08 (Source: Author, 2020)

2.2.1 Data collection

Primary data has been collected from the reconnaissance survey. Existing utilities and infrastructure, existing waterbody, vegetation, location and influence area of pollution source has been observed during the survey in figure 2. In case of secondary data, data is collected by past research, study papers published by NGOs or researchers related to Khulna city water and sanitation situation and Satellite Image. The existing water supply data was collected through KWSA (Khulna Water and Sewerage Authority). The data format was a shape file (.shp), gathered from secondary sources such as BBBike, USGS, Google Earth Pro etc. Landsat Image has used mostly for the analysis.

2.2.2 Landsat Data

Landsat 7 and 8 images were collected from USGS for analysis for the year 2009, 2014 & 2019. Landsat 7&8 measures different ranges of frequencies along the electromagnetic (Macarof & Statescu, 2017).

Table 1: Landsat Data Information

| Sl. No. | Landsat | Path | Row | Acquisition Date |
|---------|---------|------|-----|------------------|
| 1 | 08 | 137 | 44 | 09/10/2019 |
| 2 | 08 | 138 | 44 | 31/10/2014 |
| 3 | 07 | 138 | 44 | 25/10/2009 |

[Nasa Landsat Science]

2.2.3 Data Processing

Image has been classified from the Landsat data using Image Classification tools in the ArcGIS. By this classification, land use change has been identified over the period of time and from that land use change can be predicted.

- a) **Land use classification:** In ERDAS Imagine Software, the obtained satellite images were optimized for increased clarity by means of most filter techniques. The True Color Composite (TCC) was created to choose training dataset for various LULC classes using appropriate band combinations for all images (Good & Giordano, 2019) (Foody, 2002). Depending on the Maximum Likelihood Supervised Classification (MLSC) method, the images obtained by Landsat were categorized into four large LULC groups (water body, built-up area, vegetation and open area) for 2009, 2014, and 2019. In terms of generating LULC maps at each LULC class, about 25 samples were gathered. Using 180 ground truths from reachable field measurements and Google Earth photos, the accuracy of land cover maps was assessed. These 180 pixels were selected by means of a simple random procedure (Pontius & Millones, 2011).
- b) **Normalized Difference Vegetation Index (NDVI):** A widely popular tool for monitoring vegetation Situations Using Red (R) and Near Infrared (NIR) bands, NDVI is calculated which is 3 and 4 band respectively of Landsat 7 and 4 and 5 band respectively of Landsat 8.

$$NDVI = \frac{NIR-RED}{NIR+RED} \dots \dots \dots (1)$$

- c) **Normalized Difference Built-up Index (NDBI):** It is applied to track buildup areas. It is suitable for evaluating buildup expansion through remote sensing and GIS methods. By using Shortwave Infrared (SWIR) and Near Infrared (NIR) bands which is 4 and 5 band respectively of Landsat 7 and 5 and 6 band respectively of Landsat 8, NDBI is calculated.

$$NDBI = \frac{SWIR-NIR}{SWIR+NIR} \dots \dots \dots (2)$$

- d) **Normalized Difference Water Index (NDWI):** NDWI in next equation is a normalized difference water index is known to be strongly related to the plant water content. NDWI is 2 and 4 band respectively of Landsat 7 and 3 and 5 band respectively of Landsat 8. (Sinergise, 2019)

$$NDWI = \frac{GREEN-NIR}{GREEN+NIR} \dots \dots \dots (3)$$

e) **Land Surface Temperature (LST):** Thermal band (band10) of Landsat 8 and (band06) of Landsat 7 images was used for determining LST image. Various steps are involved in the estimation of LST from Landsat image (Essa et al., 2012). The digital number of thermal bands was first rescaled into Top of atmosphere radiance (TOA) using Equation (1).

$$L_{\pi} = M_L \times (DN) + A_L \dots\dots\dots (4)$$

Where, M_L = multiplicative rescaling factor; A_L = additive rescaling factor; DN = digital number of thermal bands. TOA radiance requires a mixed signal which comprises both land and atmosphere emissions. Accordingly, ambient adjustment was done to remove the influence of atmosphere. TOA radiance involves a mixed signal that incorporates all ground and air pollution. Thus, ambient adjustment was performed to minimize the emission from the environment. Therefore, TOA radiance was converted into surface leaving radiance (LT) using Equation (2)

$$L_T = \frac{(L_{\pi}) - L_{\mu} - \tau \times (1 - \epsilon) \times L_d}{\tau \times \epsilon} \dots\dots\dots (5)$$

Where, L_{μ} = upwelling radiance; L_d = downwelling radiance; W = transmission; ϵ = emissivity. The atmospheric parameters like transmission (τ), upwelling radiance (L_{μ}) and downwelling radiance (L_d) values were obtained from an atmospheric correction tool. Then, the surface leaving radiance was converted into LST using Planck's law as given in Equation (3). $T_s = \frac{K_2}{\ln(1 + \frac{K_1}{L_T})} \dots\dots\dots (6)$

Where, K_1, K_2 = Thermal Constants; T_s = Land Surface Temperature. (Bala & Prasad, 2018)

2.2.4 Analysis

To fulfill the research objective, data obtain from different sources are analyzed through different GIS and Remote Sensing tools using ArcGIS and ERDAS Imagine software. Trend analysis of different environmental parameters are analyzed and pollution range and effects on adjacent river has shown over different interval of time though Remote Sensing Analysis. Though the area is susceptible to pollution hazards, the pollution has been emphasized in the analysis phase. Beside for the industrialization of this area, the vegetation and land surface temperature have much valuation in the environment profiling of the area.

3. Analysis and Findings

3.1 Elevation and Water Logging Scenario

For profiling the environment, elevation of the area plays a significant role in forecasting the inundation of the area during the flood. Besides decisions of the development of any project on these lands is based upon the elevation of the area. From the figure (03) it is seen that the average elevation of the area is in between 5 meters to 9 meters. Some of the area has elevation above 10 meters. But the land beside the river line, the elevation is less than 4 meters. When there will be flood or the river will over flow more than 4 meters during the rainy season than those area will be inundated. That low land is in the industrial area, they used this land for the dock for the shipment of goods.

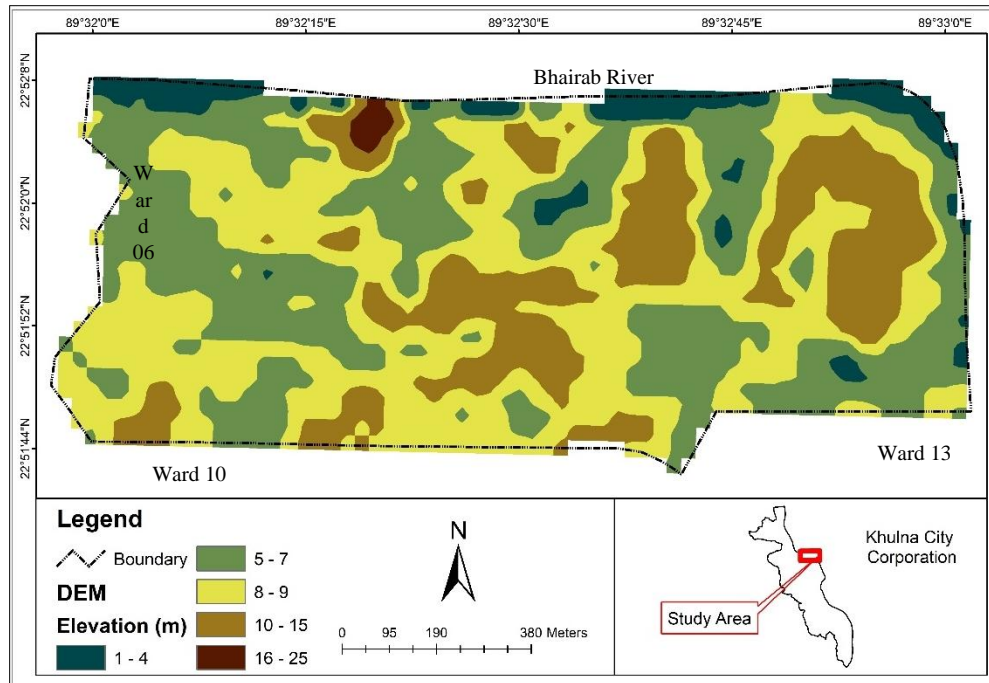


Figure 2: Elevation model of ward 07 & 08

Source: Author, 2020

Water logging is a burden for the citizen of Khulna city. This is not exception in this area too. Every year during the rainy season, people in this area suffered much from this problem. It is seen that ward 07 experience water logging much during the rainy season. The reason for this water logging is due to the bad condition of the drainage system. In ward 08, all the storm water runoff to the adjacent river which lead to no water logging during the rainy season. But in case of ward 07, people experience more water logging problems during the monsoon season and diurnal high tide. (Nargis, 2001)

3.2 Land use and Land Change

Land use human activities which are directly related to land, exploit its resources or have an impact on it. Land cover is the land's physical attributes, whereas land use is a pattern of human activities conducted within a socio-economic framework. Natural land cover is changed by using man to meet farming, homesteading, or other demands. The maximum land is used for Industrial purposes. Jute Mill, Oil Depo and Power Plant are the industries in this area. In the northern part of the area there is Bhairab River and the industries grew up based on this river line. Residential area covers the major part of the region in the southern part of the area. This residential is based upon the workers from the industry. Colonies of the workers is basically government quarter and for the low-income workers.

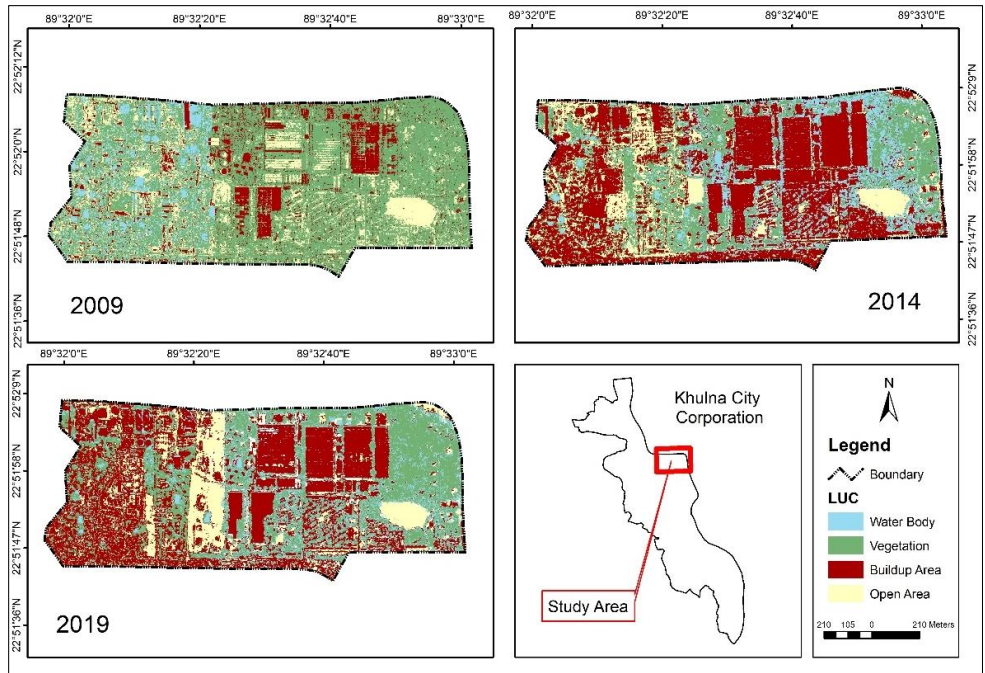


Figure 3: Land use change of Study Area

Source: Author, 2020

Change in land use is a process through which human activities transform the natural landscape, referring to how land has been used, usually stressing the functional role of land for economic activities. In the figure-05, the land use has change remarkably over a period of time. Built up area has increased remarkably from 2009 to 2019. Green cover of the area has reduced due to the expansion of the mills.

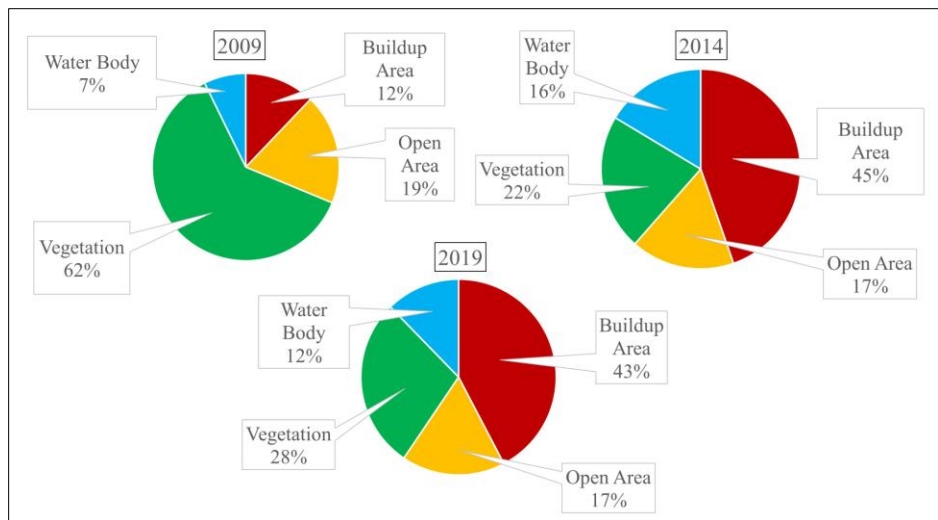


Figure 4: Land use Percentage of different interval of time

Source: Author, 2020

In the above figure 06 it is seen that the vegetation of the area is 61.52% in 2009. This percentage has decreased to 22.11% in 2014 and again it increases to 28.24% in 2019. The reason of increasing vegetation in 2019 is because of the increase of tree plantation by the Industries in their yard. As the river is meandered in this area, it is susceptible to river erosion in this bank of the river. So, industries planted trees in the bank of the river to protect it. Besides, the buildup area has increased to 44.66% from 12.14% from 2009 to 2014. This means the expansion of industries in the year range. New industry has been setup like oil depo and power plant in this area. Again, though the waterbody has been increased in 2014 from 2009 but the waterbody has decreased in 2019. This classification has been done based on the Landsat image where the resolution of the image is 30m, the accuracy of this classification is not quite satisfactory.

3.3 Effect of Temperature Change on Built Environment

Land surface temperature (LST) is troposphere pigment temperature. LST depends on how much sunlight each geographic area receives. Besides sunlight, the land cover also affects LST, which leads to changes in the temperature of the surface of the earth.

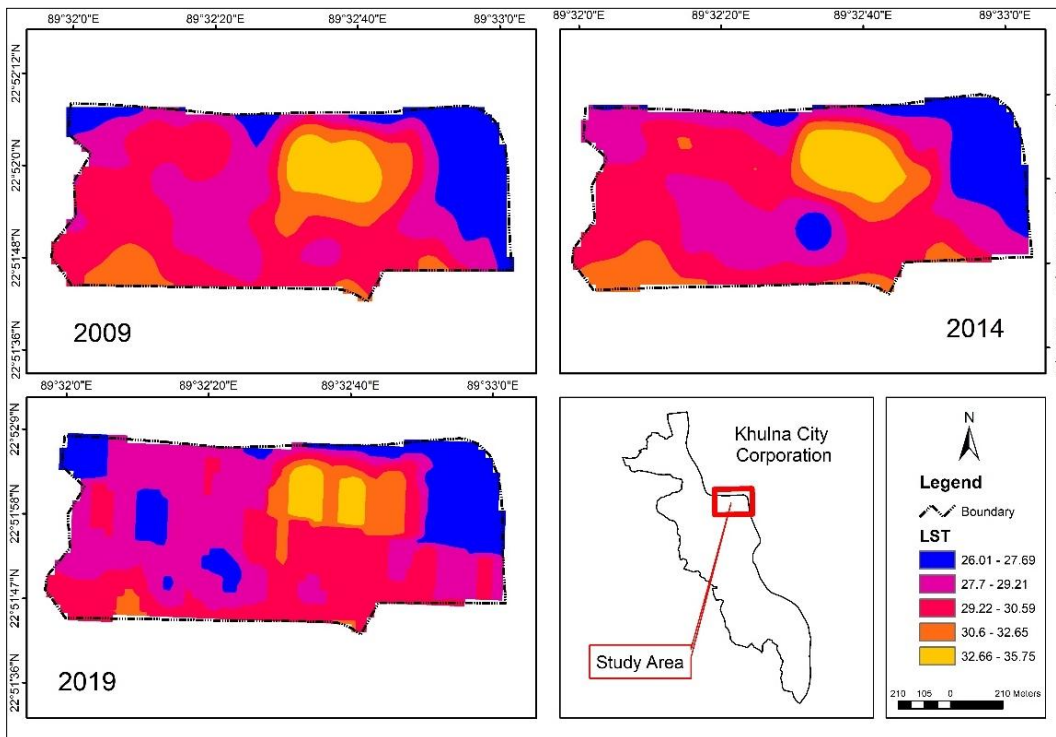


Figure 5: Changing phenomena of Land Surface Temperature of Study Area

Source: Author, 2020

Above figure 7 indicate the built environment of the area in different interval of time. The area is susceptible to high temperature due to the industrialization of the area. In 2009, the area is full of industrial activities. The average LST is in the range between 32-35

degree Celsius in the eastern region of the area. But by the flourishing of the industry, the average LST of the area has increased its range during the year 2014. But the year 2019, LST has change remarkably in the industrial area. The temperature has fallen down. It's because of the shutting down of the industries. The production of the industry has fallen down and for that there has been remarkable change in LST. But this LST has relation with built index.

There is a statistical correlation between LST and Built environment of the area showing in figure 9. As there is strong relation with the temperature of the area with the buildup condition, this analysis elaborates the relationship between two data, LST and NDBI. This relationship holds a strong position about the correlation of the data as well as the dependency of the temperature with the buildup condition in the area. The inflated NDBI value here demonstrates the region's developed area. The land surface temperature would shift along with a rise throughout the built-up area. Also, the negative value of NDBI indicates the region's vegetation portion. The temperature will rise in that region where there is a built-up area, and again as there is a vegetation area, the temperature is relatively low.

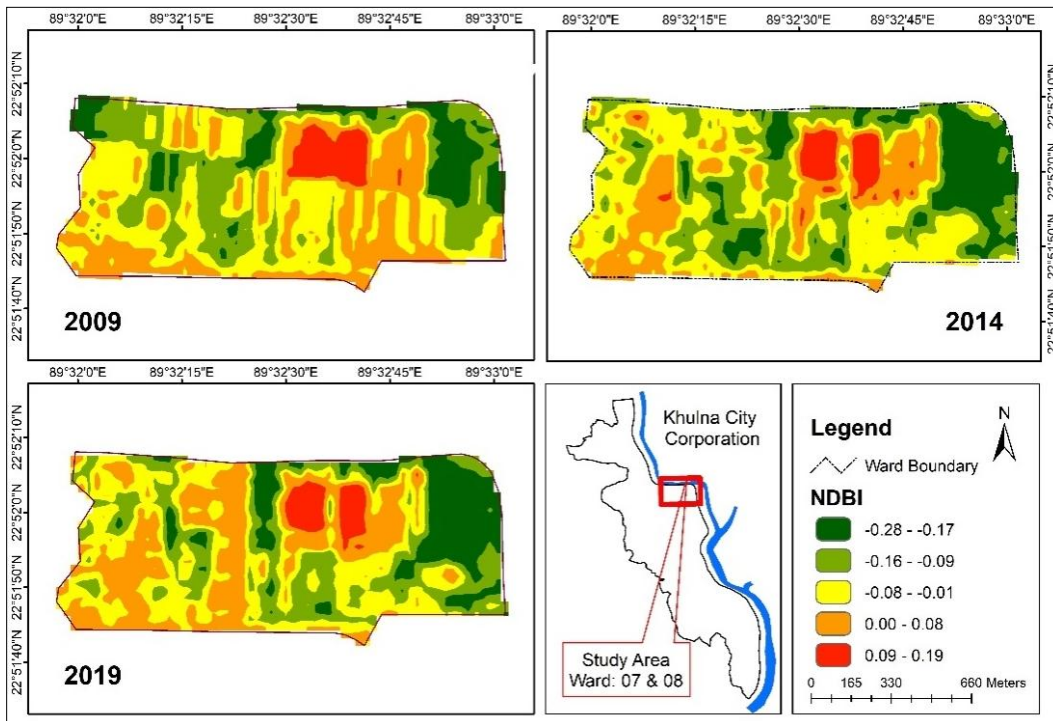


Figure 6: Built Environment of study area

Source: Author, 2020

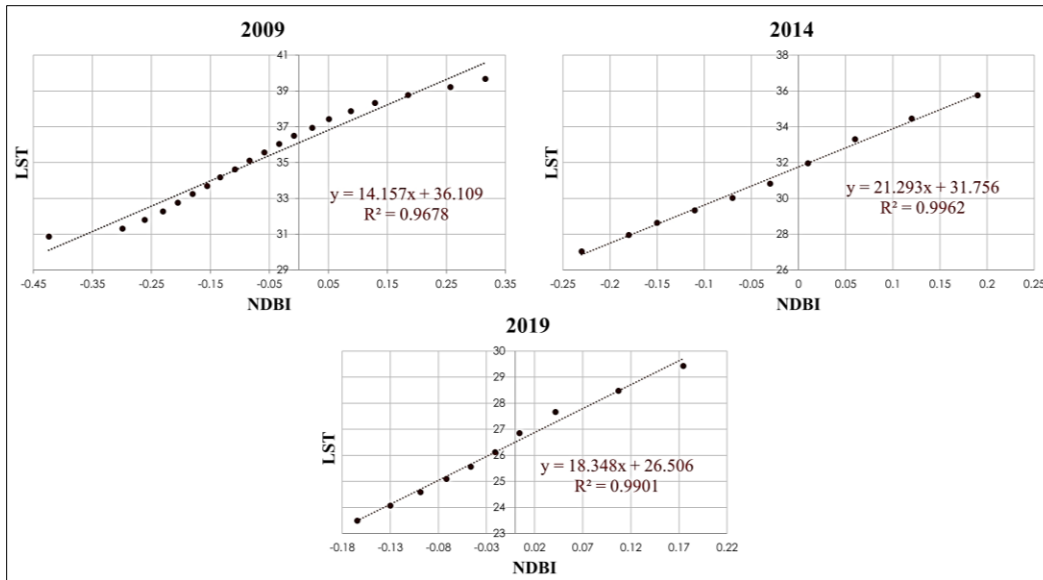


Figure 7: Relation between LST and NDBI

Source: Author, 2020

3.4 Ecosystem and Vegetation Health

There are various methodologies for studying seasonal changes in vegetation through satellite images, one method of which is to apply vegetation indices relating to the quantity of greenness. The Normalized Difference Vegetation Index (NDVI) is a measurement of the balance between energy received and energy emitted by objects on Earth.

When NDVI is applied to plant communities, this index sets a value for how green the area is, i.e., the amount of vegetation present in a given area and its state of health or growth strength. The NDVI is an index without dimensions so its values range from -1 to $+1$. In a practical sense, the values below 0.1 correspond to water bodies and bare ground, whereas higher values are indicators of high photosynthetic activity linked to scrub land, temperate forest, rainforest, and farming. (Tovar, 2011)

From the figure-10, by analyzing vegetation index deciduous trees and shrubs are present in the region. Here in 2009, the value of NDVI is 0.34 where as it increases to 0.45 in 2014. It means that the health of the vegetation is increased during that period but the value of NDVI decreases to 0.30 in 2019. The quantity and health of the vegetation decreases during that period.

NDVI is significantly influenced by temperature on a global level, and also the rise in plant activity in the Northern Hemisphere is largely attributed to a rise in temperature (Mao et al., 2013) (Maselli, 2004) (Shabanov et al., 2002). In addition, rainfall has a significant regional effect on the NDVI, particularly in arid and semi-arid areas. However, certain regions at various times are influenced significantly by climatic factors. In South East Asia, the rise in tree species before 1997 was greatly affected by the rise in

temperature, whereas the decline in vegetation cover was largely caused by the shift in rainfall since 1997 (Camberlin et al., 2007) (Park & Sohn, 2010) (Piao et al., 2015) (Piao et al., 2011) (Pei et al., 2019). For the current study area, as it is industrial area, there is a shortage of vegetation cover of the area besides the rapid buildup area may cause the rise of certain amount of temperature which may influence the value of NDVI. This interference of NDVI can be assessed in the large area whereas the current study area is very small to perform this assessment for the interreference. So, this assessment is skipped in this analysis.

From the figure 7 and 10, LST has declining over the time which causes the variation of NDVI value in the study area. It is seen that the value of NDVI is also decreasing with the decrease of temperature of the area. This declining of NDVI value, vegetation, can influence the micro climate of the area which may result in the deficiency of rainfall in the area. In 2009, the amount of vegetation is more than the previous years which make the temperature of the surrounding area more. But gradually this temperature is declining with the declination of the vegetation quantity in the area.

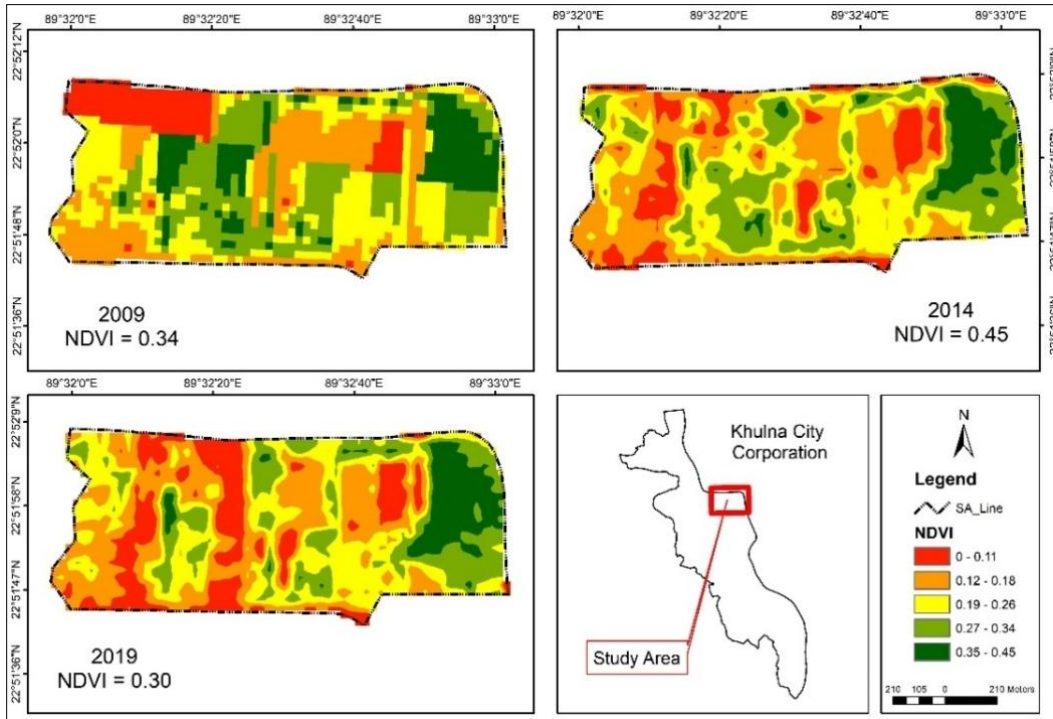


Figure 8: Vegetation Health of the area

Source: Author, 2020

3.5 Effects of Pollution on Adjacent Land use

The study area is very vulnerable to pollution due to the industrialization of the area. Surrounding environment of the industry is polluted by somehow by the effect of industrial activities. Oil Depo, Power Plant and Jute Mill present in the area. By the influence of this, soil, water and air pollution happened this area.

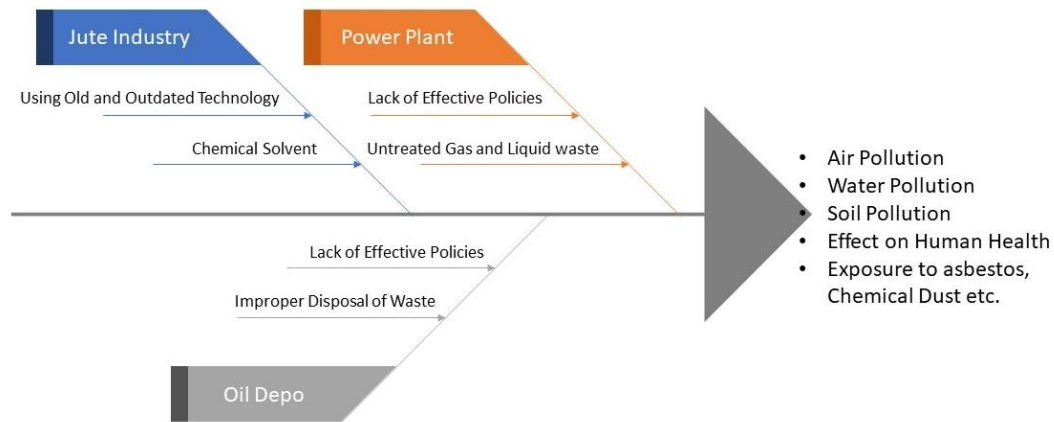


Figure 9: Cause & Effect Diagram of Pollution by Industry in the area

Source: Author, 2020

The causes of pollution by three industry has been figured out and the effects of this pollution has been shown the figure-11. Old and outdated machineries have been used in the jute industries which leads to the air pollution to the surrounding areas. Asbestos from the Jute causes serious air pollution to the surrounding area. Here the pm2.5 has been crossed above the danger level. Again, the untreated gas and oil from power plant causes serious air and water pollution in the area. The oil leaked from the power plant dumps into the soil and causes soil pollution too. Besides, oil depo presents besides the Bhairab River. This depo loads and unloads the oil from the ship. Here some oil is disposed into the water and some of them leaked into the soil. This makes serious water and soil pollution through the activities of depo. No concerned authority is found to observed the activities of the industries to control the pollution which is the violation of Environmental laws and ordinance.

A stretch of 30 meters of special and heavy-duty crops, 20 meters of buffer zone layout for small and medium-sized industries and 10 meters for light industries should be given for the buffer zone. The buffer zone development is one measure that can be used to minimize noise pollution. Besides the pollution spread out intensity is highly depended on the environmental elements and micro-climate of the area. The air and odor pollution are completely depended on the air flow and direction. Considering the area location and average meteorological data, an average 150-meter buffer from the industry is considered as highly concentrated pollution area in figure 12. This pollution intensity might be less or more than the buffer areas. This buffer areas covers almost every workers colonies in the area. Beside this pollution has influenced on the river too but this has been neglected as it is outside the area boundary. This pollution buffer only affects the workers colonies, it doesn't affect the others normal residential area.

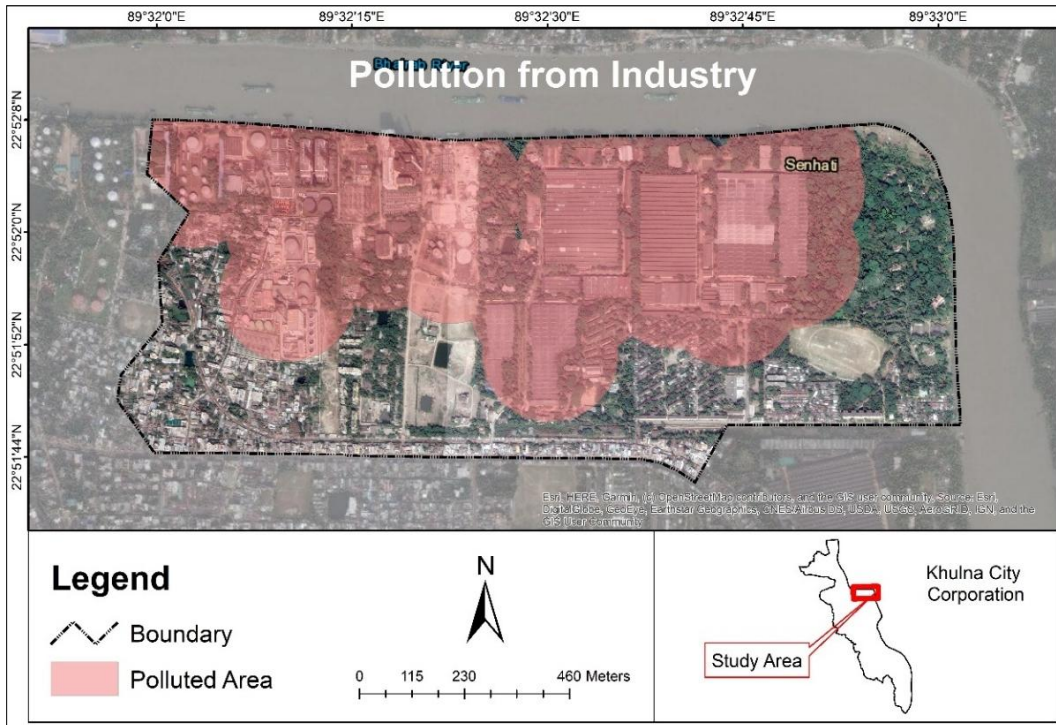


Figure 10: Pollution effective range by the Industry

Source: Author, 2020

The industrial waste is dumped into river which causes serious water pollution. The water turbidity is determined by the remote sensing by the process of NDWI. NDWI is considered to be closely linked to the water content of plants. Therefore, it is a very strong proxy for water stress in plants. By analyzing it, the pollution can be identified. The high reflectance indicates the enrichment of vegetation content in water and low reflectance indicate the absence of vegetation content in water. The polluted water has absence of plant content. In figure-13, low reflectance of water is seen in the study area in 2009. Industrial activities are highly operated during that time. So, the pollution level is much on the river during that period of time. By the course of time, the activities of industries in pulling down and the production has fallen in a remarkable way. In that period, the pollution has fallen down which is seen in 2014 and 2019 respectively. But the ship building industry has developed around the ward 30 and 31. So the pollution has more in that area. As the river has high and low tide, so the data may variate in the certain moment of time.

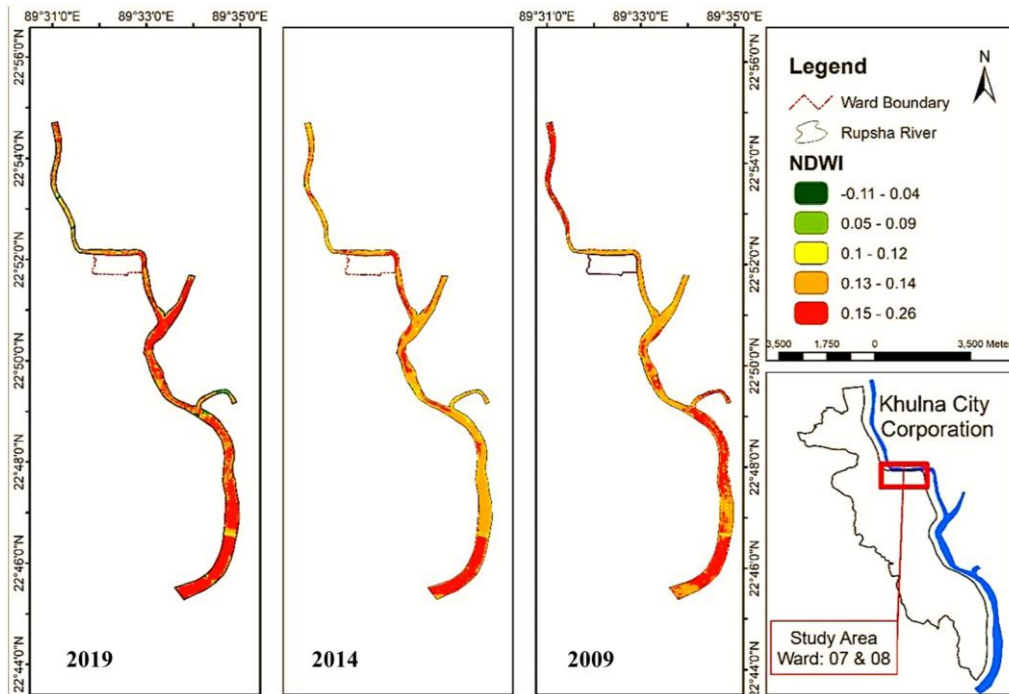


Figure 11: Pollution affected on the Rupsha and Bhairab River by the Industry
Source: Author, 2020

4. Conclusion

To identify the main environmental issues of the present situation, the environmental profile is very important. Among the 31 wards of Khulna City Corporation the pollution effects are much in these areas due to the industrialization of the area. This pollution affects much on the water quality of the river as well as air and soil pollution. Besides the elevation of the area is quite high to susceptible to flood. But due to the bad condition of drainage, water logging caused much on the ward 07 during the rainy season. Maximum land use used for the industrial use. This land use has changed during the course of time. Buildup area has increased and the vegetation cover has decreased during that interval of time in a frame of 15 years. Though the buildup area has increased but the industrial activities has diminished during that time frame which causes much on the LST and NDBI. The value of LST and NDBI has changed during the period of time. But the vegetation health has given some interesting fact about the area. In 2009 the vegetation health is 0.34 which increases to 0.45 in 2014 and again reduced to 0.30 in 2019. The quality of vegetation has increased for a certain period of time but again it decreases to the previous state. No dense trees have found in the region which indicate that the ecosystem in that area is not in a better condition. The limitation of this research is enough data has not found. All the data used in the study are might be obsolete as environment is a continuous changing process. As some data are obsolete, the results of the study may have some inaccuracy with respect to present or future scenario. Maximum people living in this area is government low-income worker. So, for implementing any project in this area, socio-economic condition and land use of the area have to considered consciously.

References

- Bala, R., & Prasad, R. (2018). A Comparative Study Of Land Surface Temperature With Different Indices On Heterogeneous Land Cover Using Landsat 8 Data. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, 389-394.
- Camberlin, P., Martiny, N., Philippon, N., & Richard, Y. (2007). Determinants of the interannual relationships between remote sensed photosynthetic activity and rainfall in tropical Africa. *Remote Sens. Environ.*, 106, 199–216.
- Daniel, T. (2009). A Trail Across Time: American environmental planning from City Beautiful to sustainability. *Journal of the American Planning Association*, 75(2), 178-192.
- Ellis, M. (2010). A Methodology for Evaluating Environmental Planning Systems: A case study of Canada. *Journal of Environmental Management*, 91(6), 1268-1277.
- Essa, W., Verbeiren, B., & Kwast, J. V. (2012). Evaluation of the Distrad Thermal Sharpening Methodology for Urban Areas. *International Journal of Applied Earth Observation and Geoinformation*, 19, 163–172.
- Foody, G. (2002). Status of land cover classification accuracy assessment. *Remote Sens. Environ.*, 80(1), 185–201.
- Gisbert, P. (2010). In *Fundamentals of Sociology*.
- Good, T., & Giordano, P. (2019). Methods for Constructing a Color Composite Image: Google Patents.
- Iyyanki, V. M., & Manickam, V. (2017). *Environmental Management chapter one-introduction*. Elsevier Inc.
- Lyon, K. G., & Brigham, C. A. (2005). Rare species and ecosystem. *Conservation Biology*.
- Macarof, P., & Statescu, F. (2017). Comparasion Of Ndbi And Ndvi As Indicators Of Surface Urban Heat Island Effect In Landsat 8 Imagery: A Case Study Of Iasi. 11(2). doi:10.1515/pesd-2017-0032
- Mao, J., Shi, X., Thornton, P., Hoffman, F., Zhu, Z., & Myneni, R. (2013). Global Latitudinal-Asymmetric Vegetation Growth Trends and Their Driving Mechanisms: 1982–2009. *Remote Sens.*, 5, 1484–1497.
- Maselli, F. (2004). Monitoring forest conditions in a protected Mediterranean coastal area by the analysis of multiyear NDVI data. *Remote Sens. Environ.*, 89, 423–433.
- Nargis, S. L. (2001). Retention Of Natural Drainage System In Khulna City, Bangladesh. Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, Department of Urban and Regional Planning .
- Park, H., & Sohn, B. (2010). Recent trends in changes of vegetation over East Asia coupled with temperature and rainfall variations. *J. Geophys. Res. Atmos.*, 115.
- Pei, Z., Fang, S., Yang, W., Wang, L., Wu, M., Zhang, Q., . . . Khoi, D. N. (2019). The Relationship between NDVI and Climate Factors at Different Monthly Time Scales: A Case Study of Grasslands in Inner Mongolia, China (1982–2015). *Sustainability*, 11, 7243. doi:10.3390/su11247243
- Piao, S., Tan, J., Chen, A., Fu, Y., Ciais, P., Liu, Q., . . . Jeong, S. (2015). Leaf onset in the northern hemisphere triggered by daytime temperature. *Nat. Commun.*, 6, 8.
- Piao, S., Wang, X., Ciais, P., Zhu, B., Wang, T., & Liu, J. (2011). Changes in satellite-derived vegetation growth trend in temperate and boreal Eurasia from 1982 to 2006. *Glob. Chang. Biol.*, 17, 3228–3239.
- Pontius, J. R., & Millones, M. (2011). Death to Kappa: birth of quantity disagreement and allocation disagreement for accuracy assessment. *Int. J. Rem. Sens.*, 32(15), 4407–4429.

- Shabanov, N., Zhou, L., Knyazikhin, Y., Myneni, R., & Tucker, C. (2002). Analysis of interannual changes in northern vegetation activity observed in AVHRR data from 1981 to 1994. *IEEE Trans. Geosci. Remote*, 40, 115–130.
- Sinergise. (2019). NDWI (Normalized Difference Water Index). Retrieved from Sentinel Hub: <https://www.sentinel-hub.com/eoproducts/ndwi-normalized-difference-water-index>
- Tovar, C. M. (2011). NDVI as indicator of degradation. Mexico.
- Tsujimoto, M., Kajikawa, Y., Tomita, J., & Matsumoto, Y. (2017). A review of the ecosystem concept: Towards coherent ecosystem design. Japan: Elsevier Inc.

"Anxiety, coping and oscillation among *Garos* Ethnicity" Impact of COVID-19 on Urban *Garos* in Dhaka City

Nahin Ahmed Rini*
Sajjadur Rahman**
Rasheda Akhtar***

Abstract: COVID-19 has a significant implication on livelihoods of urban community in Bangladesh. Day labourers, domestic workers/homemakers, small business holders, street vendors, teachers and other professions are largely devastated by this COVID-19 as they have rapidly lost their means to earn an income. Thousands of indigenous workers including women working in parlours and schools have lost their jobs with no hope for reinstatement in the near future. Less paid workers such as maids and drivers are facing a similar fate. The majority of these Garos rely upon their daily wages and the rest get by with monthly salaries, with little to no fall back This article largely focuses on the impact of covid-19 in the lifestyle of these urban Garos and coping mechanism during this pandemic situation. This study also gives a knowledge of capturing the validation of any distinctions in adapting and support based and also to explore food expenses and negotiating the quantity of meals taken by Garos during the time of pandemic. In-depth Interviews along with KII is steered via mobile devices focusing on gaining insights about the mobility patterns, anxiety level, adjustment with livelihood, survival strategies and assessing the specific requirements of this urban Garos. To conclude, Covid-19 pandemic brings such a catastrophic current and future health and financial consequences that it calls for our consideration and commitment to work together to defeat it.

Introduction

COVID-19 has been distinguished one of the biggest danger and public health crisis of global concern. This virus originating from China has rapidly crossed outskirts, infecting people all through the entire world and has prompted an enormous public response. World Health Organization announced the official name as coronavirus disease (COVID-19) (Adhikari et al., 2020). Not long after the cases were identified in the month of March about 36 million people, mostly from the informal sector, have lost their jobs (Islam, 2020). Bangladesh, having 168 million inhabitants, is one of the most overcrowded countries in the world. The word indigenous originated from the Latin word Indigena meaning “a native” (Bhuiyan, 2011). According to the census done in 2011 ,total indigenous populations are distributed 2 million which represent 1.8% of total population (Tabassum, 2016).

About 15 to 20 thousand Urban Garo resides in the northern part of which 8 To 10 thousand belongs to Norda and Kalachadpur area. They live in northeastward part of Bangladesh, covering a major part under Dhaka North city corporation. Earlier on 26 March, government urged a shutdown to control transmission of COVID-19

* M.B.B.S, Holy family Red Crescent Medical College Hospital, Master’s in Public Health, North South University, Dhaka, Bangladesh. Email: dr.nahin123@gmail.com

** Senior Officer–MIS, Practical Action, Dhaka, Bangladesh, Graduate Student, Department of Public Health, North South University, Dhaka, Bangladesh. Email: srahman611@gmail.com

*** Professor, Department of Anthropology, Jahangirnagar University, Savar, Dhaka.
Email: rashedaakhtar@gmail.com

infection. All industries and markets were shut down, all types of transportation confined. Only fundamental services kept on working. Numerous workers who were working in the restaurants or beauty parlors are either terminated or sent home with unpaid leave. Keeping in mind the population growth, healthcare adequacy, limited assets and cultural norms, the impact of covid-19 stroked the urban Garo fast and exacerbated a complex fear among the Garos residing in Kalachadpur. Lockdown have brought about expanded load of unpaid consideration at work and difficulties in their livelihood. Indigenous populaces are at more threat brought about by this pandemic of hazardous environmental exposures, unavailability of real time data and convenient healthcare benefits, and endless demographic and psychosocial conditions that obtrude sufferings upon them (Mesa, Franco, Gómez, & Abel, 2020). In this study, we tried to explore the effect of COVID-19 and its challenges to the indigenous urban Garos.

Literature review

COVID-19 is the emerging global health crisis which has seriously influenced people from all parts of life. As a developing country Bangladesh has been recognized as one of the 25th most at risk and 7th most overcrowded country in the world expected to be influenced by this fast spreading virus (A. K. Mohiuddin, 2020). It is 10th on the rundown of nations that have been most exceedingly awful influenced by Coronavirus internationally, and the high number of new cases especially in and around Dhaka – implies that the absolute number of cases could continue climbing. The pandemic circumstance demands a specific method of to lessen the spread of the infection securing the general public and protect oneself. The fast spread of the COVID-19 and its results around the world has pernicious impacts on people and society driving to fear, freeze, concern, and uneasiness (Ahorsu et al., 2020). Almost 80 percent cases been disclosed in Dhaka city and almost nearly 60% of the cases reported in the capital, Dhaka moreover, the fear of not having the normal life back, lack of awareness leads individuals to depression and increased the household chores (Shammi, Bodrud-Doza, Islam, & Rahman, 2020). According to IEDCR based on a recent study it was suggested that middle aged people suffered by this infection mostly and the rate is 24% (Mohiuddin & Research, 2020).

The Ministry of Education shut every educational institutions and both the Higher Secondary School Certificate (HSC) and comparable assessments were delayed inconclusively. Closing of schools during the lockdown further added to the load of unpaid care work on women who assimilate most of the extra work of caring for kids (Corburn et al., 2020). Students cognitive behaviors and performance is always related to physical health. One study disclosed that some actual health problems started in the pandemic due to remaining at home which comprises changes in the sleep cycle, loss of desire, actual dormancy, weight gain, weakness which quickens their enthusiasm for pedagogy (Sakamoto, Begum, & Ahmed, 2020). As per the latest declarations, all educational organizations will stay shut until further declaration. Although, from 1st June the lockdown has been somewhat lifted and public vehicle, public and private workplaces and business have been restored, permitting on a restricted measure (Corburn et al., 2020).

Country's health system is dominated by women, where more than 90% of community health workers are female. It is assumed that this crisis and its contagion effect in society

and communities will continue; this suggests that a huge number of female health care providers will need support to balance the huge workload and family responsibilities e.g. child support, safety issues, mental health support (T. Haque et al., 2020). Since individuals are isolated and they remain inside more often than not, the abatement in junk food consumption may likewise be a consequence of wellbeing perception since their regular physical activities have diminished which are credited to increased incidences of different cardiovascular issues and other illness (Booth, Roberts, & Laye, 2011). An ongoing review was directed covering both urban slum and provincial zone in the long stretch of April by Power and Participation Research Center (PPRC) and BRAC Institute of Governance and Development (BIGD) expressed that 77.2% of at risk non-poor really fell underneath the poverty line because of economic emergency by Coronavirus and past the 20.5% of the populace at last perceived as poor, likewise expressed a gathering of 'new poor' speaking to an extra 22.9% of the populace that should have been brought inside the discussion on destitution (Ovi, 2020). During this pandemic most of the people favored reaching health care specialists over phone for treatment purpose, which might be on the grounds understanding the relationship between health care specialists and patient. Because of fear of getting the virus more individuals reached the health specialist virtually since individuals are worried being contaminated by the infection in bodily contact (Shadmi et al., 2020). WHO has recommended some guidelines for mental health and psychosocial considerations as Covid-19 is creating stress and anxiety among the general concern and imposing a negative impact on the mind (Shadmi et al., 2020). General wellbeing approaches must be executed with consciousness of how this pandemic has influenced health care circumstances and general wellbeing practices for Indigenous peoples (Richardson & Crawford, 2020).

Urban areas are the central hitting point for Covid-19 where 90 percent of total cases been reported. A report shared by the United Nations Policy Brief on the impact of COVID-19 on the urban setup stated that work of urban people badly affected by this virus which resulted in other demarcation for acquiring safe water, as well as estimation of space they have to maintain for social distancing (K. J. S. S. Power, Practice & Policy, 2020). Due to global housing crisis nearly, one billion people, have been pushed to live in slums or informal arrangements and are increased risk of rapid transmission of this virus due to overcrowding in low-quality housing in urban setup (Sadeque, 2020). This pandemic is more challenging to the urban setup for over population, weaker health systems, and limited resources (A. J. E. J. o. S. D. R. Mohiuddin, 2020).

There are more than 50 indigenous communities residing in the plain areas of the country generally in the southeast part of the country known as Chittagong Hill Tracts (CHT). As an underestimated populace, the indigenous peoples have for quite some time been cut off from the advantages of standard as they do not live in enormous urban setup, and have restricted access to medical facilities. Their discernment, way of life, food habit during any pandemic also changes from majority of the populaces living in the comparing setup. Response to a pandemic may therefore be worsened and even life-threatening among such indigenous population (Mesa Vieira, Franco, Gómez Restrepo, & Abel, 2020). Indigenous groups conventional ways of life are a source of their adaptability, forcing a danger at this time in restricting the spread of the infection. As Covid-19 infection is spreading worldwide, just as the high death rates among certain risk groups with fundamental health issues, information on the pace of disease in

indigenous peoples are not accessible. Important details about this infection and preventive measures is likewise not accessible in ethnic dialects (T. Power et al., 2020).

Garos are one of well-known ethnic communities of the Indian subcontinent, most of them are residing in Northeastern India primarily in Garo hills, bordering Mymensing division of Bangladesh. Garo populace is one of the greatest indigenous communities in Bangladesh, comprising of around 0.1 to 0.13 million people among the indigenous populace. In Bangladesh more than 90% of them living in the Gazipur, Mymensing, Netrokona, Tangail, Sherpur, Jamalpur and Sylhet locale (Drong, 2004).

Indigenous peoples from various corners of Bangladesh are experiencing extreme starvation due to Covid-19. Involved with minimal pay occupations and working at family houses, as watchman or drivers, most have misplaced their employments. Also, public and non- legislative development programmes have been restricted and various regions are not accepting any funds (Moin, Sakib, Araf, Sarkar, & Ullah, 2020). In spite of known susceptibility and high death rates, little data identified with the rapidity of COVID-19 in Indigenous peoples is assembled up until this point (T. Power et al., 2020). This article will highlight the issues of urban Garos, the challenges they are facing in this pandemic.

Methodology

This research was qualitative research. To understand tension, oscillation and strategy during COVID-19 this study has selected Kalachandpur area close to Norda where Garo community reside, Gulshan-2 in Dhaka District as field. It was quite difficult to collect fieldwork data at the time of COVID-19. But information is collected through maintaining certain hygiene rules. We also conducted the interviews over phone because of COVID-19. For data collection, we used two qualitative data collection methods named Key Informant Interviews (KII) and In-depth Interviews (IDI). A total of 12 (5 female & 7 male) IDIs and 5 KIIs were conducted for this research. Interviews were conducted in Bangla. Although Garo community has own language and scripts, they are also fluent in Bangla. Therefore, no language interpreter was used in this study. During data collection we tried to explore focusing on gaining perception about the mobility patterns, the experience of daily survival, methods for dealing with stress and evaluating the particular necessities of Garos in urban setup. Data was collected using an unstructured interview guideline. Prior to interview verbal consent was taken from all the study participants. For data analysis, details notes were taken from all interviews. Thematic analysis was implemented for drawing results. We manually placed code themes as per our research objective and summed up important data in English directly under each code.

Impact of COVID-19 on Garo Community in Urban Dhaka

Since the lock down explicit many organizations conducted small survey indicating the challenges faced by the low income people. A recent survey conducted in the month of June by Sajeda foundation on urban low income people stated that about 94.3% of respondents were distressed about unemployment and limited income (Dr Shoshannah Kate Williams, 2020). Garo residing in Kalachadpur area are middle to low income people. On average most of them run their own small business stores inside the area.

Some are shopkeepers, some works in nearby beauty parlor, some are school teachers and some others doing volunteer work in their community. There are several shops in that area including clothes shops, tailors fast food stores which were completely shut during first two months of the lockdown period. One of the female respondent (Taira Chisam,38) from a small local shop said, *"I have not earned anything due to the lockdown," she said noting that her daily income was around 600 Bangladeshi takas before the lockdown"*.

Many of the families are struggling there with compromising their daily expenditure less than Tk. 100 per day he mentioned. Some of them are in most vulnerable state because their average income was below ten thousand in the lock down period. These people used to be ubar drivers, pathao riders and private drivers who were unable to continue their daily jobs and was unpaid for two to three months. It was very difficult for them to give the house rent, managing food stuffs for families and continue their daily life. Despite the fact that individuals were encouraged to remain at home, some cart pullers ,motorist kept working in the roads, consequently violating the stay order (Sakamoto et al., 2020).

Covid-19 and losing of livelihood: Living in nightmare

Without any means to earn an income during lockdowns, many urban Garos who are low paid employees are unable to feed themselves and their families. Throughout the shutdown, when all work was halted, restricted number of individual were moving, and only on an emergency basis. Cafes, Tea stalls, Road side restaurants, had to close, public vehicles were not permitted in the city, and no family had maidservants. Along these lines, the individuals who lived in slums totally lost their earning at this time of emergency. The average earnings in the slums of Bangladeshi cities and among the rural poor has dropped by over 80% since the episode. An amount of 63% of slum occupants turned out to be financially idle during this time, and per capita pay in the slum dropped by 82% from 108 BDT (\$1.30) to 27 BDT (\$0.32) (A. K. Mohiuddin, 2020). Almost 35 to 40 families living in Kalachadpur undergoing severe hardship. These people are still finding it difficult to put food on the plate amid the prolonged shutdown. Other ethnic communities living in different areas of the country are also in a somewhat similar situation. Mostly day-labourers who are working in different parlous– are barred from going to work because of closure of their work place now. Almost half the female Garo used to work in various beauty parlor in Dhaka but since the lock down started they have lost their jobs and are now facing difficulties in livelihood. One female respondent (Jemichisim, 35), said, *"The famous Persona beauty salon chain employs 2,500 Garo women who are currently jobless now"*. She mentioned *"I used to work at a well-known beauty parlor in Dhaka, but since march my parlor is closed. I got the payment for the month of march only. Rest of the months were quite difficult for survival as I was passing each day with all my savings. She mentioned she had to borrow money to pay the house rent and now tensed how to return back the money as she has no income source now."* She also said previously *"I used to send half of my money to my parents living in the village. Now in this situation where I am jobless it has become very difficult for me to send money for family and this is making me very frustrated and upset"*.

One male respondent (Hestingrama, 42), used to be a school teacher in Kalachadpur for last 6 years. He lives with his wife and two kids. Part-time he used to run his tailor

business. Since the pandemic has emerged and government closed all the school he is running out of school teaching. His salary also stopped since march and tailor business is also shut down since march. Finding no other option, he now switched his profession into pathao rider. For him it is very challenging to become a pathao rider from a renewed school teacher. Seeing no other option and to run the family he has to take this major step for changing profession.

Another female school teacher (Benichisim, 47) she used to work in a kindergarten school. Since the pandemic has emerged after closing of all the school in that area she is currently unemployed and now she is selling some handmade stuffs and seasonal fruits in her locality for earning livelihood. She is living with her husband and two kids. Her husband is paralyzed and she is taking care of the whole family but now it is getting very difficult for her to run the family with this little income. She also mentioned *“Since a long time I didn’t get paid from the institution as its closed now it has become very difficult for me now to adjust with my savings which are almost finishing now. So I decided to start some tuition even at this pandemic crisis with no other choice left.”*

Many survival strategies have included by Urban Garos from changing jobs to breaking lockdown rules, going out as riders as opposed to pulling out in fear of being contaminated by the infection.

Contradiction with livelihood: Urban to rural migration tendency of urban Garo

Around 22 schools are there in Kalachandpur area with a number of 700 students. At least 20 Garo teachers are directly involved in teaching professions. There are severe tensions in the families along with the teachers which was their only income source. As all the schools are now closed till further order from the government many of the school teachers had no other choices left the area and returned back to village. One of the respondent mentioned (Sabitri Chiran55), *“I had no choice other than going back to my village and now doing day laborer work at 200 takas per day. I never dreamt of living this life”*. She lives with her two kids. She used to be a house worker and during this pandemic her owner said not to come to work and she been unemployed for several months. It was getting very hard for her to manage the expenses for her daily household and bearing the expenses of her kids who school going. Finding no other option, she has to return back to her village and did the daily labor.

One respondent who used to run a small shop in that locality (Sangma, 43) mentioned, *“how long we are going to live like this? I have to feed my family so I had to open my shop but it seems like we will never have our previous livelihood back as there are no selling nowadays. In that case we all need to shift to village soon”*.

Missionary Church is completely off after the lockdown has started. One of the respondent who used to work in that church (Richon, 50) said, *“I am worried by unemployment in the Garo community. To survive, many have to return home to their village, in addition to supporting their family in Dhaka, they used to send money to the village, but are now out of work. Many of them are returning to the village because they cannot bear the costs of living in Dhaka and do not have any savings left so they are sending their family members back to village and passing day alone with unemployment”*.

During the pandemic due to negative coping strategies, such as migration to rural areas put these Urban Garos in more health risk including hazards in their transport, working and standards of living and battle to get to help estimates set up by governments.

"I have no idea how he will finish his study now"-impact on education of urban Garo children:

COVID-19 has spread its impacts on the learning process of primary, auxiliary and tertiary levels in Bangladesh. Different unequalled social spacing measures taken by the government to avert the transmission of the infection, including the shutdown of educational institutions and shifting to virtual schooling, imposed a great change not only to the education system also to the students life (Dutta & Smita, 2020). The prolong home isolation period caused exacerbation and deterioration in the study routine and execution of work, which in the end brought about the development of stress and futile learning behaviors. All educational organizations in Bangladesh have remained close since March 17, 2020 to the time of composing this article. So the students from primary to tertiary level are being constrained to remain at home as opposed to going to classes to keep up social spacing. Shutting down of educational institution for many youngsters can lead significant school dropout. As these people are not that much technologically upward since last four-month total education system is stopped there. Parents are very much concerned.

One respondent (Archana morong, 40,) said, *"suddenly the university, all the classes are without any indication before. My son used to study regularly according to what the teachers teach in the class; following lectures; doing assignments and presentations. Now the class is not happening, so the study has stopped. Though I understand the present situation of crisis, I am afraid that it would put my son into a long session jam who is currently studying on 10 th standard. I have no idea how he will finish his study now."*

Many kids do not feel any inspiration in virtual learning. As there is no compelling reason to follow any daily schedule for study and setting off to the college. So most of the time children kept themselves engaged in coloring, and gaming. They were additionally occupied with different extra-curriculum activities: cooking, watching cinemas, TV, recordings on YouTube, reading spiritual books, accomplishing social work, wasting energy in Facebook, Instagram and so forth. One participant mentioned (Janika, 18 years), *"I have been home for a few months. After a long time, I am spending a lot of time together with my family. After finishing household works, I find no more time and energy left for my study. So I feel like quitting from taking home studies and feeling bored now"*

Because of COVID-19, a large portion of the respondents talked about the financial hardship, which affected on their kids contemplates. They portrayed the circumstance that a considerable lot of them lived off certain educational costs or low maintenance works for bearing their family expenses. In this season of the pandemic, all ordinary activities halted. Indeed, even their family earnings essentially decreased as COVID-19 previously hit hard the economy of the world just as Bangladesh. As the members needed to rely upon their families for every day needs, it was a load for them to oversee additional cash for purchasing web packages with the significant expense to organize online classes for their children.

'Life in a kittle' - mental health among urban Garo

The World Health Organization (WHO) defines social determinants of health as “the conditions in which people are born, grow, live, work and age.” These are identified with the “conveyance of money, power and assets,” which is guided by policy implementations. The antagonistic ailments of ethnic individuals in developed country are connected to social determinants, yet in addition to fundamental biasness in the public arena and the well-being framework, which brings about obstructions to getting to mind which doesn't meet anticipated degree of characteristics (Allan & Smylie, 2015). An improvement in the family relations of numerous respondents since the lockdown began. Family understanding improved to a certain level under a similar rooftop. This could be because of the closeness impact, as per which there tends to be an increase in mutual bonding with more physical and mental closeness with each other (Narayanan et al., 2020).

During the time of lockdown, one respondent (Jemichisim, 35) mentioned that *“I have to take care of the cooking and all the household chores and my kids were engaged in watching tv or mobile game. Sometimes it was boring as for a long time they did not went outside for any activities.”*

Both the repression and disengagement builds the danger of relational clash in families, which thus puts kids and women at higher danger of abusive behavior at home however long the stay-at-home estimates last (Mesa Vieira et al., 2020). The closure of faculties and therefore the entire family staying together has further exacerbated the burden of unpaid care work on women, who now must absorb the extra work of constant family care duties. One respondent (Mouhua morong, 21) told that she lives with her mom. She has some physical illness and previously used to walking for 30 minutes and used to go to her university by walking. Now that she needs to stay all day at home she became fatty and also her daily routine has changed. In this situation, she is not able to concentrate on her studies as well. That is why she is depressed and upset about this pandemic situation. Changes in the pattern of sleep, eating habits, digital media usage, working habit and anxiety are seen mostly in domicile environment (Narayanan et al., 2020). Perhaps the reason behind this depression in young children as because the lockdown was strictly observed in urban areas where children were forced to stay home in any means. Conversely, children in rural areas do not have any restrictions and can play freely in outdoor with their relatives/friends anytime (Yeasmin et al., 2020).

Mutual understanding and distribution of social liability among urban Garo

Because of the pandemic, numerous indigenous pioneers have assumed control over assurance, which can prompt slander of the infection and unsettle social union, causing social disengagement of populace gatherings. One respondent (Hestingrama, 42,) mentioned *“last month one of their previous Nokma (local chairman, age 60 years) got affected with covid-19 and was admits to hospital. Few days later he died. Then their recent Nokma with the help of social volunteer workers managed to collect fund for releasing the body from hospital. As the hospital authority was not releasing the body due to the bill due 1 lakh. Nokma raised a fund and collected 70 thousand and finally we brought the dead body for funeral. They gave the family some food stuffs as they were kept in isolation”*.

During the end of May one incident happened in the area of Kalachadpur. One family was brutally injured by the household owner due to unable to pay the house rent. Then by the help of community leader and volunteer's workers in that area local people raised voice against this incident. This may be because of components, for example biological impacts, alterable elements, increased anxiety and trauma, intellectual practices, mindfulness, and ecological elements during a pandemic (Bahrami, Yousefi, & sciences, 2011).

Garos have shown incredible consideration and support to their neighbors, friends and loved ones during lockdown: sharing food, distributing essential goods, and lending money to pay the house rent. With no real social safeguard, these spontaneous and organized acts of mutual aid have been a lifesaver for these hit hardest Garos residing in kalachadpur area.

Impact on health issues

Health is the best component of union for embedding advancement and progress proposals in indigenous communities, given the vulnerability to which they are uncovered despite the COVID-19 pandemic. A high extent of vulnerable group has chronic illness. These people can be considerably more disregarded once healthcare services are dispensed solely to battling the COVID-19 pandemic. Identification of cases and counteraction of infection in a transient populace are more troublesome (Mesa Vieira et al., 2020). Issues of social disgrace, lack of awareness, dread of detachment or dread because of absence of medical care, some urban Garos in spite of having symptoms might be reluctant to approach and step through tests. Many of them due to lack of money are unable to seek medical help if they fall sick rather taking home remedies. Some due to fear of social stigma are hiding their symptoms. One respondent (HorishRondi, 44 years) mentioned *"one day I was going to buy some stuffs for my family and I meet a person on the road. He was walking without wearing a mask and gloves in hand. Next day I got to know one of his family member died as a suspected case of Covid-19 and he hide the news due to social stigma and fear of isolation and in spite being on isolation he is now walking randomly on the street"*.

Addressing the health impact of Urban Garo is challenging because of their lack of awareness. The invisibility of awareness is related to the inequities themselves: under-reporting or hiding the symptoms. Thus, Garos residing in Kalachadpur are likely to be left behind from health facilities.

Negotiating with food habit of urban Garo during the time of pandemic

Respondents were asked where there any changes in their daily food habit and what challenges they faced during the time of lockdown and how they tried to managed the situation. Also how they are meeting their food needs. Food habit of urban Garo is mostly carbohydrate based and rice dominated their food basket. Their traditional food item is commonly known as Khari (pork /vegetables cooked with baking soda) (M. M. J. E. N. Haque, 2015). One study done on India during this pandemic revel significant change in the eating habit of the respondent and dropping of fast-food with 60% and 34% and indicating a less chances of developing cardiac diseases (Narayanan et al., 2020). During the time of lockdown, they often visited the bazar at late noon cause at that time no fresh

fish or food stuffs were available and they can buy the fish at a cheaper price. According to shutdown regulations, the bazars are now open from 6am to 2pm but as many of the stuffs are not available locally they have to go to distant bazar and buy stuffs at double price. One respondent (HorishRondi, 44 years) said that *“we eat rice with lentil once a day and rest of the day we took puffed rice with tea. Our children also adjusted with biscuits and tea in the evening and puffed rice at night with some plane lentil. We often visited the bazar to buy fish at noon so that we can get it at a cheaper price and the fish was not fresh also. Now we had to buy all the food stuff at a double price and most of the time baking soda was not available in the local area so we had to go to kauranbazar to buy our necessary stuffs at a double price.”*

Since the lockdown started some of the families residing in that area has previously stocked all the necessary stuffs for the rest of the month. One of the respondents (Hesting Rama, 42) also mentioned that *“I live with my wife and two sons. Both of my son are school going. Previously they used to take fast-food in the evening from local shop. In the morning before going to school they used to take noodles and me and my wife used to take nakkam(sutki) and rice. At night we used to take fish or chicken prepared as khari and rice. But since the pandemic has emerged our food habit has grossly changed. When we first heard about the lockdown me and my wife went to kauranbazar and purchased some stuffs like puffed rice, nakkham for the rest of the month. Now fast food has been replaced with puffed rice and biscuits at home. Both our children are now adjusting with this new food habit”*.

During the pandemic urban Garos have for quite some time been acclimated with adjusting to temporary food and insufficient salary by adjusting with food, eating less but with huge ramification for health and nourishment, particularly while adjusting for quite a while. During the lockdown, urban Garos have reduced their eating habit to as minimal as one supper every day, and undermined protein-rich foods like chicken, fish, with less expensive staples, for example, lentils, potatoes and puffed rice and dried fish. For the coping mechanism for adjustment to food, they have needed to obtain, or draw from what resources they may have.

Conclusion

The COVID-19 pandemic is hampering normal life of urban Garos. In this article we have shown the coping and oscillation among urban Garo during the time of pandemic and also how their livelihood has been drastically changed. For example, when an established earning person can turn a fruit seller to earn livelihood in these testing times, scores of others meeting a similar fate cannot be ruled out due to Covid-induced economic crisis. This pandemic poses particular challenges and increased the level of anxiety for urban Garos. No wonders how the Garos in this pandemic after losing their jobs would make ends meet and how they will manage their families. Having a facemask and maintaining social distance becoming norms these days, with a hope people's lifestyles, livelihood and food habits would change. Due to stigmatization and inequalities, a large number of Garos residing in Kalachadpur are not appearing or expressing their sufferings while they are in intense needs of humanitarian supports right now. Upgrading general well-being during this pandemic requires not just information from the clinical background, yet additionally of every single human perspective.

References

- Adhikari, S. P., Meng, S., Wu, Y.-J., Mao, Y.-P., Ye, R.-X., Wang, Q.-Z., . . . Raat, H. J. I. d. o. p. (2020). Epidemiology, causes, clinical manifestation and diagnosis, prevention and control of coronavirus disease (COVID-19) during the early outbreak period: a scoping review. *9*(1), 1-12.
- Ahorsu, D. K., Lin, C.-Y., Imani, V., Saffari, M., Griffiths, M. D., Pakpour, A. H. J. I. j. o. m. h., & addiction. (2020). The fear of COVID-19 scale: development and initial validation.
- Allan, B., & Smylie, J. (2015). *First Peoples, Second Class Treatment: The Role of Racism in the Health and Well-being of Indigenous Peoples in Canada, Discussion Paper*: Wellesley Institute.
- Bahrami, F., Yousefi, N. J. I. j. o. p., & sciences, b. (2011). Females are more anxious than males: a metacognitive perspective. *5*(2), 83.
- Bhuiyan, S. H. J. G. I. Q. (2011). Modernizing Bangladesh public administration through e-governance: Benefits and challenges. *28*(1), 54-65.
- Booth, F. W., Roberts, C. K., & Laye, M. J. J. C. P. (2011). Lack of exercise is a major cause of chronic diseases. *2*(2), 1143-1211.
- Corburn, J., Vlahov, D., Mberu, B., Riley, L., Caiaffa, W. T., Rashid, S. F., . . . Martínez-Herrera, E. J. J. o. U. H. (2020). Slum health: arresting COVID-19 and improving well-being in urban informal settlements. 1-10.
- Dr Shoshannah Kate Williams, M. F. H. (2020, 12 July 2020). How Covid-19 further marginalized Bangladesh's urban poor.
- Drong, S. (2004). *Eco-Park Project Threats to Evict 25,000 Garos*.
- Dutta, S., & Smita, M. K. J. O. J. o. S. S. (2020). The Impact of COVID-19 Pandemic on Tertiary Education in Bangladesh: Students' Perspectives. *8*(09), 53.
- Haque, M. M. J. E. N. (2015). Diet, Nutrition and Ethnicity: A Cross Sectional Survey on Garo Tribal People. *2*, 491-496.
- Haque, T., Hossain, K. M., Bhuiyan, M. M. R., Ananna, S. A., Chowdhury, S. H., Islam, M. R., . . . Rahman, M. M. (2020). Knowledge, attitude and practices (KAP) towards COVID-19 and assessment of risks of infection by SARS-CoV-2 among the Bangladeshi population: An online cross sectional survey.
- Islam, R. (2020, July 16, 2020). COVID-19 shatters Bangladesh's dream of eradicating poverty *UNB News*.
- Mesa, V. C., Franco, O. H., Gómez, R. C., & Abel, T. J. M. (2020). COVID-19: The forgotten priorities of the pandemic. *136*, 38.
- Mesa Vieira, C., Franco, O. H., Gómez Restrepo, C., & Abel, T. (2020). COVID-19: The forgotten priorities of the pandemic. *Maturitas*, *136*, 38-41. doi:10.1016/j.maturitas.2020.04.004
- Mohiuddin, A. J. E. J. o. S. D. R. (2020). COVID-19 and 20 Resolutions for Bangladesh. *4*(4).
- Mohiuddin, A. K. (2020). Covid-19 Situation in Bangladesh.
- Mohiuddin, A. K. J. T. A. J. o. M. S., & Research, P. (2020). A Pandemic Review of Covid-19 Situation in Bangladesh. *2*(05), 38-50.
- Moin, A. T., Sakib, M. N., Araf, Y., Sarkar, B., & Ullah, M. A. J. P. (2020). Combating COVID-19 Pandemic in Bangladesh: A Memorandum from Developing Country.
- Narayanan, L., Pandit, M., Basu, S., Karmakar, A., Bidhan, V., Kumar, H., & Brar, K. (2020). Impact of lockdown due to COVID-19 outbreak: Lifestyle changes and Public Health Concerns in India.

- Ovi, I. H. (2020). Impact of Covid-19: Additional 23% people fall in poverty in April.
- Power, K. J. S. S., Practice, & Policy. (2020). The COVID-19 pandemic has increased the care burden of women and families. *16*(1), 67-73.
- Power, T., Wilson, D., Best, O., Brockie, T., Bourque Bearskin, L., Millender, E., & Lowe, J. J. J. o. C. N. (2020). COVID-19 and Indigenous Peoples: an imperative for action.
- Richardson, L., & Crawford, A. J. C. (2020). COVID-19 and the decolonization of Indigenous public health. *192*(38), E1098-E1100.
- Sadeque, S. (2020, November 2, 2020). Coronavirus – Urban Areas Face the Brunt of the Pandemic. *INTER PRESS SERVICE News Agency*. Retrieved from <http://www.ipsnews.net/2020/07/167816/>
- Sakamoto, M., Begum, S., & Ahmed, T. J. S. (2020). Vulnerabilities to COVID-19 in Bangladesh and a reconsideration of sustainable development goals. *12*(13), 5296.
- Shadmi, E., Chen, Y., Dourado, I., Faran-Perach, I., Furler, J., Hangoma, P., . . . Rao, K. D. J. I. j. f. e. i. h. (2020). Health equity and COVID-19: global perspectives. *19*(1), 1-16.
- Shammi, M., Bodrud-Doza, M., Islam, A. R. M. T., & Rahman, M. M. J. H. (2020). COVID-19 pandemic, socioeconomic crisis and human stress in resource-limited settings: A case from Bangladesh. e04063.
- Tabassum, R. J. S. E. A. J. o. P. H. (2016). Health Paradox of Indigenous people in Bangladesh: Unravelling aspects of mass media campaigns in changing health behaviors to prevent non-communicable diseases. *6*(2), 17-22.
- Yeasmin, S., Banik, R., Hossain, S., Hossain, M. N., Mahumud, R., Salma, N., . . . review, y. s. (2020). Impact of COVID-19 pandemic on the mental health of children in Bangladesh: A cross-sectional study. *117*, 105277.

Survivors of COVID 19: Micro-ethnography of the Coronavirus Recovery Process

Akbar Hussain*

Abstract: The Coronavirus disease is an infectious disease caused by the virus named SARS-CoV-2. The new disease spread quickly and a significant number of people affected, suffered and many of them lost their lives. A considerable number of affected patients have been recovered successfully. This paper focused on the recovery process of the COVID 19 from the affected patients' perspective in a locality of Dhaka City. To understand the people's sufferings and ability of the healthcare system in the country, twelve cases have been selected randomly from the study area. The patients were affected in the first six months of the outbreak. Their vulnerability, sufferings, the treatment process, role of the family members and relatives, experience in the community life, etc. have been analyzed from socio-cultural perspective. This paper argued that the COVID 19 has created stressful conditions to the patients, their families and the institutions they are associated with. The survivors combatted it through a combination of medication, mental strength, familial support and caregiving, community based practices along with the institutional healthcare facilities.

Introduction

The infectious disease Coronavirus disease (COVID 19) is caused by the SARS-CoV-2 virus that has probably crossed species barrier and transmitted from an unknown animal to humans (WHO 2020). The first epicenter of this virus was Wuhan, China. Since its journey started in December 2019, the virus travelled the world very quickly and infected more than 84 million people worldwide and killed at least 1811364 persons till December 2020 (worldmeter.info, 2020). The United States of America is at the top of the list by the number of both affected and deaths (20 million and 0.35 million) and followed by India, Brazil, Russia, France, UK, Turkey, Italy and Spain. Most of the countries in the world had been affected by the outbreak, even the island countries such as Fiji, Malta, Seychelles, Falkland, Maldives, Cayman Islands, etc. (worldmeter.info, 2020).

A continual increasing number of people around the world were infected, they suffered and a significant number lost their lives before understanding the features of the virus, its remedies and the invention of vaccine. It had spread to the continents and created a hazardous situation in the countries. The situation affected the modes of transportation, subsistence activities, cross-border trade and movement, and influenced cultural traditions, social bonding and structure, and familial relationship. A considerable number of affected patients have been recovered successfully.

There are examples of similar pandemics in every century in human history. This is different from the previous epidemics. It had broken down the human understanding of continual development over nature. People planned to step on Mars, looking towards the highest level of technological developments and economic prosperity through extreme levels of resources extraction from nature to create an enormous comfortable life on Earth. On the other hand, According to Carmine Gorga (2020), the humans created a society of beggars where poor beg for food and shelter, middle class for job and rich for tax reduction and subsidy. This pandemic is an abnormal phenomenon that has

* Professor, Department of Anthropology, Jahangirnagar University, Savar, Dhaka. Email: akbarju@juniv.edu

challenged the humans' endless development thinking. Gorga (2020) claimed that the pandemic aggregated poverty to a more acute level. As Davis Harvey (2005) pinpointed that the neoliberal and capitalistic form of economy failed to welcome social and individual crises. Capitalistic development paralleled technological height with a hope to fulfill the wants and solve the problems like poverty in the world. The pandemic created a crisis both in the economy and society as well as a stressful life for the human population on earth.

The central theme of this paper is to present the experiences and the recovery process of the COVID affected persons in a locality of the Dhaka city. The study was based on a micro-ethnographic study from the patients' perspective. The patients were affected from several sources and recovered successfully. This paper sequentially organized in three sections beside an introduction. The first section discussed the theoretical perspective including the concept of disease and survivors of diseases, the pandemic and its implication from social science viewpoint. The second section dealt with the methodological consideration that includes a brief description of the study area, methods of data gathering and the information of the respondents. The third section presented the analysis of the strategies of the survivors' and their experiences in combatting and recovery process. The role of the family members, relatives, healthcare professionals, along with the changes in attitudes and cultural traditions has been discussed in this section. The final section contains the conclusive remarks with its relevancy to the theoretical approach.

1. Theoretical Perspective

The understandings of the disease, people's perception, and their adaptation to the social context are interconnected with each other. Disease is considered as a physiological phenomenon but inseparable from social context. Health behavior is associated with and 'responsive to cultural context' (Barrera, et.al. 2013). With the development of biomedical technologies, health is considered as an ongoing phenomenon that is controlled and managed by the institutional arrangement such as hospital, doctor, nursing, medication, etc. It could be termed as 'top-down approach' of health and disease prevention (Hussain 2019). The memories of families indicated that it was impossible to separate the situation of disease from socio-cultural context of that disease. This is the part of socialization and cultural adaptation in society (Cohen 1974, Chigona 2013). This study argued that COVID 19 had been combatted by its carriers through a combination of medication, familial support and community based practices and mental strength which could be seen from 'bottom-up approach' (Hussain 2010, 2019). Social science and public health explores the contexts and diversified meaning of medication and health management (Smith and Vonthethoff, 2017, Ingold 1994, Rainbow and Rose 2006), adaptive strategy of patients with family and community support, (Chib, 2013), role of medical institutions (Till 2017), social organization in health management (Goetz, 2010, Fotopoulou, 2016) and health seeking activities (Latour, 2005).

The influence of the viruses or bacteria on the physiological status of the human body is a natural process. The survival is subject to the resistance and the reaction of the human immune system. The vulnerability of humans depends on the capability of physical resistance. Besides the usual diseases, the pandemic created a situation where humans

became more vulnerable because of the unknown feature of the disease SARS-COVID 19. This stage is explained by philosopher Bruno Latour (2020) that the virus was within the system. By this, he tried to make understand that the virus is a natural phenomenon that had existed in the natural environment and transmitted to humans from animals.

Social scientists need to think about multifaceted considerations. Firstly, societies exist in a form that is looking for a continual development through sustainable development goals (SDG). The government and the international organizations are working with coordination to the local people and societies. This process has been disrupted by the uncertain and unpredictable intercept of Coronavirus. The systems in the societies have been broken down. The family members are struggling to rebuild their families and reshape the institutions of the society temporarily. Secondly, the world had faced many uncertain and Hazardous conditions in the past such as the two World wars, civil wars, wars among the nations, environmental calamities, epidemics like Spanish flu, Ebola, swine flu, the HIV/AIDS, etc. Those have created the path of development uneven for humans. The mankind had won at last and overcome the situations through the combined efforts and cooperation.

This pandemic will end in a day. The situation in the world will return to its own pace through a combination and collective initiative of the humans. The only other option is the negative or worse condition which will not happen hopefully. The Humans must work together to avoid the worst. Social scientists have to think about rebuilding the social system. Robert Costanza and others (2020) presented a-two way solutions. The society may go back as it was before or will be better than the past and present situations. The rebuilding process requires a short-term intellectual investment and a careful attention on the one hand and longer-term act on the system for desired future on the other.

2. Methodological Consideration and the Respondents

This paper presents the struggles and experiences of COVID 19 survivors. The respondents were selected from Angar, Dhaka City. The locality is a tiny area with one kilometer length and a half kilometer width. It is a crowded area mostly occupied by the people having low-range of income. The total population is approximately 30,000. The area is surrounded by one of the most affluent zones of the city in the west whereas in north and south are two congested and crowd areas. In the east side is low lands covered with water – yet to be ‘urbanized’. It is a part of Ward 38 of Dhaka North City Corporation. Ward 38 had more than five hundred Corona patients, while the area Angar recorded approximately 70 patients. This study is focused on the people who were affected by the Coronavirus and has recovered.

A total of 12 survivors were selected as respondents of this study. Data had been collected in several phases through an interview and discussion through Key Informant Technique (KIT) and Telephone Interview. A minimum level of open-ended discussion had been conducted after maintaining social distance and safety measures. The respondents are representing diversified age, occupation, familial background, education, socioeconomic condition, gender and length of living in the area. Among the respondents, seven were male and five were female. Age ranged from 21 to 40 years (five respondents), 41 to 60 years (five respondents), 61 to 80 years (two respondents). In case of occupation, four respondents were from service holders in government, autonomous

and private sectors and other six are businessmen, migrant workers, contractor, and two were home maker. In case of socioeconomic background, three patients were from middle class family, five were from upper middle class and rest four patients were from rich families. From educational ground four patients had no formal education, two had schooling up to higher secondary and other six had post graduate degree. The patients were living in Angar for long time. Seven patients' families were living in this area for more than 20 years. Three families were living for more than 10 years. Two families moved here 10 years ago.

2.1 The Respondents

This section will present a brief description about the respondents of this study. The pseudo-names were given for the purpose of anonymity. A total of twelve respondents (five females and 8 males) were selected randomly.

The first coronavirus patient of this study was identified on March 22nd. Two migrant workers (Taher, age 30, respondent of this study, and his brother) returned from Italy on March 14th and 19th respectively. He was the carrier of coronavirus in this locality. His affectedness understood by March 22nd after arrival. He had a fever and took medication and followed other guidance according to the prescription given by his known physician. He suffered until April 21st. His sickness traced that he was affected either immediately before his departure from Italy or during his journey to Dhaka. The recovery took longer because of the two brothers had interaction in house which lingered some symptoms for many days. The second patient (Rozy, age 50) was a worker in the health sector that deals with Coronavirus. She received her test positive on the April 29th. Along with her colleagues, she was working there since February at the coronavirus unit at the IEDCR. In the last week of March, Rosy was facing serious shortness of breath and throat ache. She consulted her office, tested positive and was admitted in hospital on March 29th. Following her, the third patient (Ruma, age 60) has been identified on March 31th. She was affected by the coronavirus through an interaction with her close-door neighbors, where a person came from abroad and stayed for a week. Ruma did not know that information. She visited that house frequently during the last week of March and she was exposed with fever and throat ache. She was one of the first groups of patients who are interacted with returnee patient in March.

These three patients infected early in the coronavirus outbreak in the country. Among the respondents, one patient was found infected in April. A total of six patients have been infected in May, which was the peak season for the outbreak. Two patients were infected in June. Most patients struggled for their life during the months of May and June.

Three asymptomatic Corona cases were found among the respondents. This phenomenon is related to the death of the family members from COVID 19. Soma (age 40), Titu (age 35) and Jami (age 42) were found among the respondents. Soma was infected by the family member. Her father-in-law had died a week earlier in hospital for kidney disease and diagnosed with Corona positive just days before his death. It was traced that Soma with another four members of her family including her husband, child and her brother-in-law tested positive. They were infected from the hospital environment where many patients and their attendants also tested positive. Titu lost his father on May 11th. Before the death his father, he was tested positive as he was serving as an attendant to his father

in the hospital for more than 10 days. At the critical situation, physician confirmed corona positive for his father, and Titu was also tested positive on that day. His conditions were asymptomatic like his father. He was sent home and isolated from all family members and prescribed medication. In this family, more three people were affected by the virus, but they were tested later. Titu recovered in two weeks and tested positive on May 25th. Jami lost his father on May 25th and he tested positive immediately. Two other members of his family were also infected. He was recovered by June 18th.

There were three cases: Aysa (age 52), Jahid (age 35) and Kabir (age 49) who were infected from coworkers, workplace and visited duty areas. Aysa (age 52) was exposed to the COVID 19 through her coworkers during performing office duty. She was exposed with fever, cough and muscle pain simultaneously which lasted for first the four days. After initial recovery in the first phase, she faced another challenge one week later. She lost her sense of smell and was also experiencing mild diarrhea. She consulted the doctor and took antibiotics for the second time. Two members of the family were affected by the virus, and other two (children) were isolated from Aysa and her husband. She recovered by the third week of June. The other female respondent, Rabia (age 40) was exposed to COVID-19 through the street vender. She suffered from pain, cough and cold. She was tested positive on May 30th, however, recovered by the June 20th.

Jahid visited his duty areas besides shopping for two consecutive days in April. Five days later, he experienced fever, and complained about throat ache in the following day. He tested positive on April 29th and went under medication. He recovered by June 15th. Kabir tested positive after conducting office for few weeks in May-June. He experienced worse condition of headaches and cough at the same time around June 25th. The doctor advised him hospitalization but he decided to take treatment at home and follow the guidance of physician. He is recovered by July 6th.

Two construction workers and contractors, Abu (age 61) and Kazi (age 48) exposed and experienced the COVID 19 one after another (May 5th to 25th and May 25th to June 2nd). Abu suffered from shortness of breathing beside his usual asthmatic problem which is followed by fever and throat ache. He continued medication and followed other instructions of the local physician. Kazi suffered from cold, fever and headache followed by tastelessness in addition to Jaundice. None of them traced their infection sources. They visited many places and met many people including construction workers, building owner, logistic suppliers, and shopkeepers. Both individuals received treatment at home and recovered with the help and support from families and physicians. Only two of the survivors (out of 12) have been hospitalized in the recover process.

The COVID 19 exposed among the respondents through a series of symptoms (Table 1). Out of 12 patients, three patients were asymptomatic. They were tested positive with having no symptoms. Fever, throat ache, cough, shortness of breath, cold, body or muscle pain, locked smell or tastelessness (loss of smell) was the common features beside the headache and diarrhea. Out of rest 9 other patients, six were exposed with fever as a major symptom, dry cough or cough exposed in three patients, and muscle pain and shortness of breath were for the remaining patient. There were three categories of exposed symptoms as discussed here. The first category was with starting with fever and accompanied by other symptoms. There was a patient who was symptomized fever only.

For other four cases, fever was the major symptom accompanied by one or more indicators: cough, cold, sneeze, throat ache, headache and diarrhea as subsidiary indicators. Cough was exposed as major symptom accompanied by muscle pain, sneeze, fever, and jaundice among three patients. Remaining patient was exposed muscle pain with the combination of cold and sneeze and shortness of breath accompanied by fever and throat ache, respectively. Only two patients exposed through shortness of breath but this was vital treat to their lives. Only a single patient (Kazi) complained about Jaundice which might not be a symptom but it was exposed to him at the same time.

Table 1: Cases of Survivors: Symptoms, Contact Traced (multiple answers counted)

| Symptoms | (Number Of Cases) | Contact Tracing/sources estimated | (Number of Cases) |
|---------------------|-------------------|--|-------------------|
| Fever | 6 | Infected/transmitted by family members | 4 |
| Throat ache | 3 | Workplace/coworkers | 4 |
| Cough | 3 | Dealt with patients/hospital | 3 |
| Shortness of breath | 2 | From hospital/other patients | 2 |
| Muscle/body pain | 2 | From abroad | 1 |
| Loss of taste/smell | 2 | Street Vendors | 1 |
| Cold | 2 | Neighbors/returnee visitor | 1 |
| Headache | 2 | Outside/Shopping area | 1 |
| Diarrhea | 1 | | |
| Jaundice | 1 | Transmitted to family members | 3 |
| Asymptomatic | 3 | Untraced/Unknown | 2 |

In case of contact tracing or estimating the sources of their infection, respondents confirmed the sources of virus transmission according to their best of understanding. None of them has seen the virus but they estimated the sources as they got contact with other patients, infected persons and places from where they had been carried/ received the virus. Four patients believed that they were infected by their family member and on the other three respondents felt their responsibility to infect their own family members (Table 1).

The average sickness period is 20 days. The mean and the median are the same (20) number of days. The minimum struggling day is 16 days and a maximum of 28 days. This is calculated from the exposer of symptoms to the receiving final test report. The Most of the patients (10) faced first seven days as critical period of their sickness. Two patients had gone through longer critical period. Among them, one was exposed a second time after 11 days of initial exposure, and another patient had connection with his brother, was also exposed after 12 days for the second time. Both of them were the migrant workers from Italy. They took longer time (28 days) to be cured (Table 2).

Table 2: Survivors' exposure to COVID, Medication and other advice in recovery Process

| Days | COVID 19 Status | | | Medication | | | Advice | |
|--------------------|-------------------|---|--|--------------------|--|---|--|--|
| 1 st | Incubation period | | | | | | | |
| 2 nd | | | | | | | | |
| 3 rd | | | | | | | | |
| 4 th | | | | | | | | |
| 5 th | Symptoms exposure | | | <i>Paracetamol</i> | <i>Ivermectin and Antibiotic</i> | <i>Antihistamine, Zinc Tablets, Vitamin B, C, and D</i> | Drink warm water, Black tea, Green tea, Ginger and garlic tea clove and cardamom | Salt-water gargling 3 to 4 times/day, Breathing practice for 3 to 4 times/day, Physical exercise: 30 minutes - 1 hr/ day |
| 6 th | | | | | | | | |
| 7 th | | | | | | | | |
| 8 th | | | | | | | | |
| 9 th | Maturity | | | | | | | |
| 10 th | | | | | | | | |
| 11 th | | | | | | | | |
| 12 th | | | | | | | | |
| 13 th | Recovery | | | | | | | |
| 14 th | | | | | | | | |
| 15 th | | 2 nd time infection, Maturity and Recovery | | | <i>Paracetamol</i> and Antibiotic (repeats for 2 nd time infection) | Zinc, Vitamin | Drink warm water, Black tea, Green tea, Ginger and garlic tea clove and cardamom | Salt-water gargling 3 to 4 times/day, Breathing practice for 3 to 4 times/day, Physical exercise: 30 minutes - 1 hr/ day |
| - 20 th | | | | | | | | |
| 20 th | | | | | | | | |
| - 28 th | | | | | | | | |
| | | Late Recovery | | | | | | |

In case of medication there was not much diversification. Physicians in Bangladesh tried to combine different medicine for the treatment of Corona patients. The most successful treatment was a combination of antibiotic and *Ivermectin* worked well. Physicians prescribed these medicines in two ways: either antibiotic *Azithromycin Dihydrate* with *Ivermectin*, or *Doxicycline Hyclate* with *Ivermectin*. *Paracetamol* has been prescribed in both groups. In addition to this, an *Antihistamine, Zinc, Vitamin B, C, and D* also prescribed. The patients are advised to drink warm water, black tea, green tea, ginger and garlic tea with a combination of clove and cardamom. Along with medication, they are advised to gargling 3 to 4 times, breathing practice for 3 to 4 times, and physical exercise for 30 minutes to an hour a day (Table 2).

Paracetamol is widely used as medication for COVID 19 treatment. Usually it starts from the 5th day or since the beginning of symptoms exposed. For the first week, *Paracetamol* is prescribed 4 times a day or one tablet every six hours. Depending on the fever, the dose decreases gradually to three times a day, twice a day and finally once a day. It continues to the end of recovery phase. *Ivermectin* was taken as a single and fixed dose of two tablets at a time. Recently, this dose has been changed to total of 4-6 tablets and one tablet a day. The antibiotic *Azithromycin Dihydrate* and *Doxicycline Hyclate* have the

fixed course of five to seven days. Sometimes the course tenure differs depending on the strength. Two respondents took antibiotics for longer time for second time infection.

3. Combatting COVID 19: Survival Strategies

The experiences of COVID survivors' experiences, survival strategies, role of the family members, relative and neighbors and the impact of the disease on the community have been discussed in this section. This section divided into six subsections. It started with a discussion about the stressful situation among the patients, their families and relatives (3.1) followed by the impact in the locality (3.2). Later, the discussion focused on the consequences of commoners' activities and its impact on the patients which derived a situation that patients are not disclosing the status with the COVID (3.3). The next subsection (3.4) presented the role of family and relatives in recovery process and to overcome the situation. In the final two subsections, the treatment process, patients' rationale to choose home or hospital treatment (3.5) and the changes in social and cultural traditions have been discussed (3.6).

3.1 Stressful Life for COVID 19 Patients, families and relatives

Corona created a stressful life for the patient, their families and the community. The concept 'stress' has been defined by Hans Selye (1976) as 'the non-specific response of the body to any demand for change' (1956) or 'the rate of wear and tear of the body' (Selye 1976). The patients are undergoing both physical and mental stress due to the virus. The number of deaths is higher than any other disease catastrophes in the recent history. The previous one was the Spanish flu of 1918 to 1922. It is a stressful for the family because of losing a family member is not only a number rather is the loss of a beloved one within a complex social, economic and emotional attachment of the family. Status of the family in the community, inter-relationship with the other families in society and institutions are changing due to the death of a family member. Within the family, there are many impacts of the death. If the deceased person is a prime member then the economic impact carries the great influence over the living and survival of the family. If the person is a home maker, then the total household activities become undisciplined. Each family members has a role in the family as well as and emotional attachment to the family. The death creates the gap which is not repairable and irreversible. Community is consisted of many families. Thus, there is definite impact of any health condition in a particular family. The structure reshapes and establishes new social relationship between the family and the community or society.

Among the COVID survivors, an acute stress has been observed. Patient felt very nervous when they had fever, cough or asthmatic problem. Physical stamina decreases during the fever and it depends on the duration and temperature. Higher temperature for long time is an alarm for the patient due to the possibility of losing the control over the body. In this case patient can lose the control of his activities such as walking, carrying something, sleeping or sitting somewhere for the time being. If headache is accompanied by fever, the patient gains a further acute stress level. Secondly, many patients fall into the chronic stress level, where they had to fight with the physical and mental stress. The physical symptom of sickness gives patient a stress of life. Besides, the social events come into consideration such as the economic cost of treatment, the challenges of the

family, the emotional attachment and relationship to the family members, the cost of the hospitalization, strategies and the procedure of the institutional treatment, etc. A combination of physical and mental stress creates a chronic stress level. Thirdly, the coronavirus patient goes through the distress of having negative connection of daily life such as feelings, economic hardship, livelihood challenges, and uncertainties in work place. Among the survivors, many of them become happy after returning to normal life and became confident about their physical and mental strength, reluctant over there daily life and activities, feelings of strong emotional bonding with the families, realities, neighbors and friends. This level could be termed as eustress.

Most patients become panicked during their infection period. Very common features have been identified among the patients. After the exposing symptoms, the first and second day, patients understand the problem with a few symptoms such as fever, cough, headache etc. After 2-3 days the symptoms disappear. Patients consider the situation as seasonal cold, cough or fever. This is a pattern of rhythmic flow of the coronavirus. The interval is observed two to seven days. Finally, the virus exposes itself with multiple symptoms: fever, cold, cough, sneeze, headache, throat ache, diarrhea, and muscle pain, which is when the real struggle starts. Patients try to fight for life and future. Any negligence can turn into a critical situation. On the other hand, the proper medication can allow for a smooth recovery.

3.2 Panicked Situation in the Locality

Coronavirus resulted in panic within the locality. People never heard about this type of virus and were never affected by such viruses in the past. Moreover, they heard that there is no known treatment to this disease. It gave them an image of a one way track to the death. This mindset resulted in panic among the families and neighboring communities. Harmony and the solidarity in the society have been broken down due to the decrease of trust and reliability on each other. For the first few weeks of March and April, the local people spent their days with a tremendous pressure on their physique and mind. They were afraid of being infected and understood a definite consequence to death. They tried to imagine the difficulties of treatment in the Intensive Care Unit (ICU) or life-support in the hospital, which created a stressful condition which is different from their normal life. They kept watching the news from the electronic and social media and read the newspaper to get the update of the coronavirus in the country and abroad. When they heard that the coronavirus kills huge number of people in USA, Italy, Spain, Germany and England at the beginning of March and April, they became nervous. There logic was that if the developed country cannot manage it how can a underdeveloped country like Bangladesh manage the situation and save its people with an underdeveloped healthcare system. They were waiting for the briefing afternoon by the Institute of Epidemiology, Disease Control and Research (IEDCR), Department of Health of the government of Bangladesh and tried to understand the situation by two indicators: number of affected people and number of deaths. A marginal hope has been created by the number of recovered people. The months of March and April were the most stressful time that people spend in the locality. The stress was relieved in May and June, as people gradually got the courage of taking treatment at home in a traditional way or in hospital in case of severe problem. They argued that if there was no medicine worldwide for the coronavirus how they could rely on the hospital and the department of health of the country. They

consulted with the physicians and health experts and followed the guidelines to combat coronavirus pandemic.

3.3 Undisclosed Corona Patients

The second trend found among the patient is that they are not disclosing their infection status. There are some reasons in this context. People were very afraid and aware of this virus since March, when coronavirus outbreak started in the country, most people considered that the infection of coronavirus has results in death. Certain incidents took place in different communities in March and April. If a coronavirus patient was identified in any house, the neighbors and outsiders locked that house and did not allow anyone to go out for any purpose, even for buying necessities. In some cases, the apartment building consisted of more than 10 flats and families were closed for a single patient in a flat, which resulted in a lockdown of almost 60-70 people. The neighbors, with the help of local people, closed the gates with multiple locks and did not allow anybody to go out or come in. In front of some houses the neighbors flew red flag in many cases to indicate corona patients. Patients considered it as humiliation instead of corporation for controlling the virus. As a result, most people started hiding their virus infection to prevent such measures from taking place within their house or apartment. The patients or their families did not disclose the situation to any neighbor or outsiders about their sickness and provided treatment within their home confidentially. From the middle of May, it became a common feature to trace the location of corona patients in the locality. Few relatives and close friends were informed. Relatives give a regular visit rather than visiting or helping the patient. According the local authority, 70 to 100 patients were infected by the coronavirus which were reported. This study and the information collected by the key in formants observed that the real number of patient is higher than this. It is estimated that 200 to 300 people were affected in the area. In most houses, there were patients, but nobody informed the neighbors about it. The family only informs the doctors, health workers, and pharmacists for prescription and medicine for the coronavirus patient. The people had done it with confidence because the treatment that is given in the hospital is ensured at home in a better way. If there is chance to get cure in the hospital, then there is a higher chance to be cured at home with the help of the family and physician treatment. This is the major reason that people did not let others to know that there is a patient in the house or compound. Here, home owners and the tenant had a mutual understanding to keep the information hidden and not to disclose to any outsiders. Moreover, going to the hospital increases the risks for the patient for further infection and their attendants to get infection. In addition, there is cost for medication, hospitalization, attendants, transportation and others.

3.4 Family and the relatives played a Vital Role

Coronavirus has generated a severe crisis in the country. The locality is not out of its invasion. In the crisis, the firsthand cooperation is observed to come from the family members. Family members include spouse, children, siblings and in-laws relatives who are living in the same household. In addition, cousins, nephew and niece, uncle and aunts are also considered as family members. In some cases, house assistants, drivers, security guards, personal assistants, were close to the family and dedicated to do everything for them. Family is considered as place for final shelter. It is the place where nobody left

someone behind. For every patient, family members played the vital role for the proper treatment according to their economic and social capability. The family members had stood behind in the treatment process, decision making, taking to the hospital, collecting prescriptions and medicine. They took care of the patient over day-night and inspiring patients to stay mentally strong. Family members were ready to do whatever was required for the patient's recovery and assistance. They shared feelings, looked for a common future, hoped for the better treatment and recovery, and performed every duty assigned to them beyond their capacity. They prayed for the recovery of the patient whom they love, respect and honor cordially without any interest for money or rewards. When people lost their immediate family members, they became unaware of their own physical condition. They concentrate on the family situation at hand, and try to understand how to overcome the situation harmlessly.

Patients and their family members are satisfied over the role of relatives. Relatives are considered as those living nearby, visited the patients frequently and cooperate broadly. The relatives who are living far, they used to talk over phone very frequently. The traditional bonding among the relatives had been tested in this crisis situation. Well-wishers always tried to keep contact with the patients' family. On the contrary, there were some neighbors and some relatives tried to avoid them considering their involvement and risk. They never visited or called the patient, even they did not provide any information where and what to do in this situation. Patients and their families are frustrated in this issue and expressed their sorrow by saying 'we knew who are true to us and who are not, days will not be the same'. These were recorded in their mindset and they will determine the status of the relationships in future. Corona gave them an opportunity to understand the social relationship, and the community or neighborhood bonding. They understood that some friends and families were helpful and some were disgraceful and non-cooperative. Few families received a lot of help and cooperation from the patients' families in past. Their avoiding tendencies created a frustration among the patients and their families. This study observed that this could be a factor to rethink, reshape and restructure the social relationship among the members of the society.

3.5 Treatment at Home or Hospital: Decision Depends on the situation and Reality

Medication is very important for this treatment, as well as the instruction from the experts that could help the patient, their family members, neighbors, and others. If the doctor is not consulted accordingly, then it is difficult to manage or recover from the problem. Patients take some decisions by themselves or by their family to do treatment either at home or in the hospital. Patients believed that their treatment in the hospital will not go well, and instead would like to be at home with the help of their family members and suggestion from known physicians. The efficiency of the Department of Health and Ministry of Health Government of Bangladesh became questionable. Firstly, there were no expert virologists in the country who can work on the coronavirus. Secondly, the government did not provide adequate equipment to the physicians, nurses, and other health workers in the hospital. That is why treatment in the hospital became very difficult and far from expectation.

Thirdly, doctors were visiting the patient infrequently and provided instruction from a safer distance. Fourth, the doctors themselves are not clear about the treatment needed for

the patient. Media disclosed the problems in the hospital faced by the patients and their attendants especially the inadequate physicians and health workers, insufficient treatment equipment, medicine, unhygienic condition of the hospitals, and scarcity of beds, mismanagement in the hospitals, corruption and misbehavior of the hospital workers with the patients and their relatives. As a result, people lost their confidence in hospitals. The number of hospitals is limited for patient as well, as the beds in each hospital are not enough to accommodate all the corona patients that were declared by the IEDCR.

It was difficult to get accommodation in the hospital, but it was tougher to get treatment in the hospital. The patient who went for the ventilation process faced severe challenges. Since they did not get enough treatment, many of them died in the first phase of the treatment during March and April. It created an unreliable reputation for the hospitals overall, and people tried to understand the type of medicine they can use, and if they can manage this ventilation or any other things at home instead.

3.6 Changes in Social and Cultural Traditions

The society has some challenges to observe and participate in several cultural and religious traditions. They had to avoid practice many of their ceremonies and rituals. Some common practices were prohibited to perform. The inhabitants of the locality were living in a social bonding for a long time. They were used to having everyday chatting and gossiping, gathering in the teal-stalls and restaurants, walking together, visiting each other frequently, etc. as their regular activities. A frequent visit to the relatives' house is a common practice in the culture of the society in general. The senior members of the household or family observed a great liberty to visit relatives' houses very frequently. Irrespective gender differences, they were visiting the relatives including sons and daughter families, cousins families, neighbors, people from the same regions, friends and coworkers. The families used to observe many events such as birthdays of the younger members of the family, marriage anniversaries of the couples, birthday of the seniors and death anniversary of the deceased members of the family. Gathering in many social, cultural and sport activities were common among the people. Associations of the age-based groups and their activities were visible in the community. The shopkeepers used to have a good mannered relationship with their customers. The local corner shops were full of visitors during the days and evenings. The locality seemed a live community.

Since the beginning of the pandemic, significant changes were observed. Maintaining social distances, limiting gathering and staying home definite influenced the community life. Firstly, there was a disruption in usual community life. Familial gathering, community issues, visiting relatives, chatting, gossiping, tea-stall and restaurant gathering and corner shop- gathering have been minimized or disappeared due the outbreak. State agencies such as the local councils, police station and administrative authorities imposed a prohibition on all kinds of gathering and public functions. Secondly, the magnitude and the severity of the virus keep people alarmed not to take part in any activities that can enhance the risk of being infected and sick. Initially the symptoms of the virus affectedness were known as fever, cold and cough which were very common among the people in the locality throughout the year. It made them confused about the people residing in the compound, neighborhood and the locality. Thus, it was difficult for the

locals to differentiate coronavirus infected persons from other influenza-affected persons. As a result, avoiding and maintain distance were observed common in the locality.

Thirdly, visiting or helping others lowered since the beginning of the pandemic. The sources and the transmission method were unknown to the people. The uses of Mask, cleaning hands with soapy water, maintain distances were considered preliminary mode of safety from infection. The commoners avoid getting contact or touching known and unknown patients. This lingered to the helping each other, visiting friends, neighbors and relatives. A very few unavoidable circumstantial evidence were found where the person felt having responsibly to help the patients or their families. Such cases were available only in hospitalization or supplying foods, medicines and information only. Finally, a significant change has been observed in the case of funeral and burial activities. The cultural practice in these activities has been stepped down due to the outbreak. An unknown fear of spreading virus from the deceased had made them bound to avoid funeral and burial activities. In many cases it was extended to limiting the participation of the family members in the ceremonies. The media showed some funerals in which only designated experts are performing those activities with huge restrictions and avoiding mass gathering/participation. It also kept pressure among the local people to image the severity of danger in burial activities. A great cultural traditions has been changed due to the pandemic is a significant learning for the local people.

4. Conclusive Remarks

The COVID 19 patients have different perception about the people's understanding of the disease. A common perception is that general people are not taking it easily if they came to know that someone is a patient. If somebody knows that a patient is living nearby, an unsecured and anxious feelings starts within them. Everyone is afraid of being affected by the coronavirus, and a general tendency of the community members is to avoid and look away from the coronavirus patient, instead of inspiring and helping them for quick recovery. An attitude of avoiding and exclusion takes place in the society. In general circumstances, people do not follow the guideline such as safety equipment, social distance, etc. However, when they become aware of a virus case, they become very serious about their precautions. They are serious not only about that residence, but also avoid the roads and surrounding neighbors. These are very common among the educated or illiterate, rich or poor, friends and family or neighbor even doctor nurse or pharmacist original people. Nobody cares about the pandemic contest except their own security and keeping themselves in a peaceful mind. The say that avoiding is better for the patient to cure quickly. This is absolutely and unhealthy situation and it is unexpected for a community where the members are living together for several decades. They are assumed to have a good relationship over the years and share their views always and interact with each other in every occasion. They are used to shopping in a common place, having tea, chatting together, gossiping, and sometimes working together. The social relationship in the pandemic situation has reorganized, rearranged and restructured due to their level of interaction and attitude towards each other. Some COVID patients expressed their concern with frustration that they understood the society and community in terms of relation and attitude which is a great learning for them and if they will survive, they will think about this matter and arrange themselves for their future interaction. It is understood that the pandemic is changing people's attitude, perception, interaction,

relationship, and their thinking about their future. It will have the consequences in their future interaction and perception about others, which will influence the community organizations in upcoming days.

It was necessary to keep the person at home and avoid crowded areas when the virus was supposed to explore and expand in the areas. March and April was rising season of expansion of the coronavirus. When affected, the patient not keeps the information hidden and must inform to the proper authority as well as other members of the household, nearby households, and the neighbors. People can keep themselves safe and get rid of virus. The failure of a person creates a high penalty for others who are living nearest to the affected person. If someone gets symptoms, it is expected to contact the appropriate authority, doctors, health centers, or hospitals to get proper treatment. Unable to do this means that a lack of consciousness. Keeping information hidden was a sign to affect more people in the society which no one should be doing.

People need to share their experiences and the difficulties that they are facing during the COVID problems. Sharing their experience can help others to understand the magnitude of the disease, as well as make it possible to overcome it. If nobody shares the problem, then other people cannot understand what happens during the sickness. People take mental preparation after gathering that knowledge from experience of the affected person and try to adjust their own vision that what will they do when they will be in the similar situation.

The asymptomatic patient can transfer the virus to others if social and physical distance are not maintained and have close contact. No matter whether it is symptomatic or asymptomatic, the virus affects a person after getting entry into the body by any means.

COVID 19 gave similar experience in the life of patients who are affected and survived. The respondents of this study who have been infected had the experience of existing between the life and death. When they understood that they are infected, they became vulnerable and considered themselves in a liminal condition where they had to think about survival or be defeated by the disease. Diseases are responsible for creating problem in human body as well as stressing the human mind. A continuous pressure over the human psychology can become unbearable and traumatizing. COVID 19 is kind of disease which not only affects human organs rather but also create a stressful life for the patient. After getting infecting by virus, it takes a short time to reach a critical stage. It starts with a few symptoms of fever, cough, cold, headache, muscle pain, diarrhea and short breath, and escalates further to more severe symptoms.

It was commonly expressed by the respondents that prevention is the best method for saving someone from the coronavirus attack. If someone is affected by the coronavirus, he or she needs to care about three things; staying mentally strong to overcome the situation, taking medicine accurately that has been prescribed by the physicians, and finally food intake should be enough to prepare body with antibodies to fight against the disease. Secondly, it is usual that nobody is prepared for the disease, but everybody should take care of their health and understand their body. Every abnormality or changes should be marked and take proper care against that if essential. With a gradual increase of the age, physical condition should be considered carefully and concerned more. Any ignorance can be harmful for anytime. Thirdly; it is important to follow the physician's

suggestion, not assuming the problem of the body and taking medication on the basis of assumption. Medication is so important that each of the medicine entering does work on the body. That is why the body must have that capacity to work with the medicine.

The survivors are considerably the successful people who returned to life from the risk of death causes disease. The survivors of COVID 19 had faced such a challenge in their life that was unexpected and sudden.

Irrespective the age, gender and the socio-economic status of the family, the survivors are the privileged persons in the sense of a successful recovery. They are considered the beneficiary and the recipient of at least one or many of the following: healthcare facilities, Medicare and institutional nursing, better care from the families, stronger backup from the economic and social capital, etc. The treatment process, the initiatives and steps taken by the governments, role of healthcare professionals are different regarding the strength and capability of the state and institutions. On the other side, the experience of the recovery process differed from each other. There was a gap between the people's understanding and the scientific understanding of recovery from the infection. The experience and the understandings of the survivors, their care givers, families, relatives and friends varied depending on the status of the people, social bonding and cultural practices.

References

- Barrera, M. Castro F, Stryker, L., Toobert, D, 2013. Cultural Adaptations on Behavioral Health Interventions., *Journal of Consult Clinical Psychology*, 8(12): 196-205
- Chib, A. 2013. The Promise and Peril of Health in Developing Countries, *Mobile Media Communication*, 1: 69-77
- Chigona, W. 3013, A Review on Health Research in Developing Countries, *Journal of Communicative Information*, 9(3):
- Clarke, A., Shim, J. Mamo, L. Fosket, J. and Fishman, J. 2003. Bio-medicalization: Techno-scientific Transformation of Health, *American Sociological Review*, 68:161-94
- Cohen, Y. 1974. *Man in Adaptation: The Cultural Present*, Chicago: Aldine
- Costanza, Robert, and et.al (14 authors), 2020. After the Crisis: Two Possible Futures, *Solutions*, 11(3), URL: <https://www.thesolutionsjournal.com/article/crisis-two-possible-futures/>, December 20, 2020
- IEDCR, 2020, The Institute of Epidemiology, Disease Control and Research, Report, Website <https://iedcr.gov.bd/>, Dated June 30, 2020
- Fotopoulou, A. 2016. Training of Self Care, *Health Sociology Review*, 26:54-68
- Goetz, T., 2010. *The Decision Tree: Taking Control of Your Health in the New Era of Personalized Medicine*, Published by the Rosdale, New York, USA
- Gorga, Carmine, 2020. A Deeper Cultural Shift to Meet the Coronavirus Challenge, *The EcoIntersect*, 2020, URL: <http://econintersect.com/pages/opinion/opinion.php?post=202012040044>, January 2, 2020
- Harvey, David, 2005. *A Brief History of Neo-liberalism*, New York: Oxford Press
- Hussain, A 2010, Development: Looking through the Lens of Theory, *Journal of Anthropology*, 14:65-86
- Hussain, A, 2019. *Commercialization of Healthcare in Bangladesh*, Research Report, Jahangirnagar University

- Ingold, T. 1994. *Introduction to Culture*, London: Routledge.
- Latour, B. 2005. *Reassembling the Social*, London: Oxford University Press
- Latour, Bruno, 2020, This is a Global Catastrophe That Has Come From Within, *The Observer*, July 1 and 6, 2020, (interviewed by Jonathan Watts), URL: <https://www.theguardian.com/world/2020/jun/06/bruno-latour-coronavirus-gaia-hypothesis-climate-crisis>, Accessed July 7th, 2020
- Rainbow, P. and Rose N., 2006. Biopower Today, *BioSocieties*, 1: 195-227
- Selye, Hans, 1956. *The Stress in Life*, McGraw-Hill
- Selye, Hans, 1976, *Stress in Health and Disease*, Elsevier
- Steers, W., Elliott, E. Oskamp, S. Ditman, D. 1996. The Health Beliefs as Predictors of HIV-Preventive Behaviour & Ethnic Differences in Prediction. *Journal of Social Psychology*, 136 (1): Page 99-110
- Smith, G., Vonthehoff B. 2017, Health by Numbers: Exploring the Practice and Experience of Datafied Health, *Health Sociology*, 26:6-21
- Till, C. 2017. Commercializing Bodies, in Lynch, R and Farrington, C, (eds), *Quantified Lives and Vital Data*, UK: Palgrave
- WHO. 2020. World Health Organization, Worldmeter Coronavirus website: <https://www.worldometers.info/coronavirus/>, Date accessed: June 30, 2020
- Worldmeterinfo.com. 2020. Worldmeter Coronavirus, URL: <https://www.worldometers.info/coronavirus/>, December 30, 2020

Predicating Land Use/Land Cover Changes for 2050 Using CA-Markov Model and LCM: A Case for Maheshkhali Island, Bangladesh

Tanjinul Hoque Mollah^{*}
Munia Tahsin^{**}
Nur Mohammad^{**}
Md. Rakibul Hasan^{**}
Naiem Mollah^{**}

Abstract: Satellite imagery is a vital tool to study exclusively spatio-temporal distribution of Land Use and Land Cover (LULC) changes including various socio-ecological concerns such as decadal changes of LULC with anthropogenic activities, relations among physical environment, cultural landscape, and human activities. This study used Maheshkhali Island, Bangladesh as a case study. Besides that, there are five multi-temporal Landsat images were used in this study which acquired in 2001, 2005, 2010, 2015, and 2020 accordingly. Among them, three are from Landsat 5 Thematic Mapper (TM) and two are from Landsat 8 Operational Land Imager (OLI). Images were classified into eight classes using the maximum likelihood supervised method. This study explores land change matrix for 2000-2020 and predicts the LULC dynamics for 2050 using CA-Markov chain model and Land Change Modeler (LCM). Hereafter, their accuracy was measured by kappa statistics and overall accuracy methods. Finally, this paper reveals that the pattern of land use land cover has been identified from 2001-2020 and predicted the pattern of change for the next 30 years till 2050. It may help the policymakers to make decisions on future landscape planning and to perceive the present condition of Maheshkhali Island for proper management.

Keywords: LULC, Remote Sensing, Change detection, CA-Markov model, Prediction.

1.0 Introduction

As of late, land use and land cover change based research is used broadly in worldwide for identifying the dynamic processes, land change matrix, and its facts. Land use and land cover are the most common term are used in geospatial analysis. Land cover refers to the biophysical condition of the surface of the earth such as soil, vegetation cover, water bodies, and other physical features (Liping et al., 2018). Whereas land use incorporates the ways that land is used. For instance, agriculture, salt production, built-up area, forestry, etc. There is various popular Change Detection Model which are used worldwide for analyzing the past land use pattern and using the trend to predict about the future. Markov model according to CA Markov is one of the significant models as it functions on Spatio-temporal changes of the landform (Mondal et. al, 2016). In the simulation of landscape changes, the Markov model is widely used for its advancement with GIS and remote sensing (Baker, 1989, Muller and Middleton, 1994). Maheshkhali is the only mountainous island of Bangladesh and it has the unique geologic condition and geomorphologic complexities. The island is unique in this term that Maheshkhali Island

* Associate Professor, Department of Geography and Environment, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh. Email: thmollah@juniv.edu

** Research Student, Department of Geography and Environment, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh, Email: muniju45@gmail.com, nurmohammadju45@gmail.com, rakibhsumon@gmail.com, mollahniem79@gmail.com

is the type of accretion landform since 1972. From 1972 to 2010 (38 years) it added about 47 sq. km at a rate of 1.2 sq. km per year (Islam, 2011).

Maheshkhali Island and its neighboring area along with Cox's Bazar, Matarbari and Sonadia Island have gone through egregious changes recently because Government wants to make it the digital island with seventeen projects where exist three power plants, four gas pipelines, two LNG terminals, five economic zones, one regional highway, and one eco-tourism park along with an IT park (BWGED, 2017). It can be identified and analyzed by using LULC models and Land Change Modeler (LCM) from Landsat satellite images that help to evaluate land-use policy. The establishment of these development projects will change the pattern LULC of Maheshkhali. The simulation of the spatial pattern of LULC obtained from the probability of transition matrix from Markov and CA Markov helps to predict the future LULC change based on the transition matrix of the past with affecting driving forces (Han et al., 2015; Gillanders et al., 2008). Using kappa statistics, the model is validated and kappa statistics is the best as it counts the pixel-level accuracy (Pontius et al., 2003).

The main concern of the study is to analyze the land use land cover pattern of greater Maheshkhali Island from 2000-2010 and 2010-2020 using Markov and CA Markov along with LCM and from this matrix analysis predict the land use land cover of 2050. Therefore, the main goal of this study is to 1) analyze the land use land cover change of 2000-2020 using Landsat TM and OLI along with Markov and CA Markov 2) predict about the LULC of 2050 using the transition probability matrix trend.

2.0 Data and Method Description

2.1 Study Area

The Maheshkhali Island is the only hilly island which is located in the northwestern part of Cox's Bazar district, Bangladesh lies within $21^{\circ} 20' N$ - $21^{\circ} 50' N$ latitude and $91^{\circ} 45' E$ - $92^{\circ} 00' E$ longitude separated from the mainland through the Maheshkhali channel.

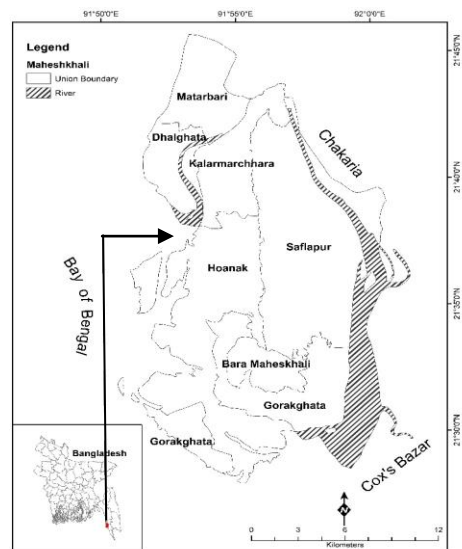


Figure 1: Study Area map of Maheshkhali Island, Cox's Bazar District

Source: Compiled by authors, 2020

The greater Maheshkhali Island which is constituted with Sonadia, Matarbari, and Dhalghata Island where Matarbari Island joint with Dhalghata Island is separated from the Maheshkhali mainland by the Kuhelia River whereas Sonadia situated in the southwestern part separated by Baddar Khal (Majlis, 2013). The study covers an area of approximately 38850 ha. Recently the area has gone through major LULC changes because of rapid developments in every sector planned by the Government.

2.2 Data and Methods and Processing Approaches

Five Landsat images were downloaded from the United States Geological Survey (USGS) which are used in this study. Three Landsat 5 Thematic Mapper (TM) for the analysis of 2000, 2005, 2010, and two Landsat 8 Operational Land Imager (OLI) were downloaded for 2015 and 2020. The image was processed by ERDAS IMAGINE 2014 and IDRISI Selva software.

Table 1: Detail information of satellite images used in this research

| Satellite Imagery | Path/Row | Acquisition date | Resolution (m) |
|---|----------|------------------|----------------|
| Landsat 5 Thematic Mapper (TM) | 135/045 | 13/12/2000 | 30m |
| Landsat 5 Thematic Mapper (TM) | 135/045 | 25/11/2005 | 30m |
| Landsat 5 Thematic Mapper (TM) | 135/045 | 23/11/2010 | 30m |
| Landsat 8 Operational Land Imager (OLI) | 135/045 | 23/12/2015 | 30m |
| Landsat 8 Operational Land Imager (OLI) | 135/045 | 20/02/2020 | 30m |

Source: Compiled by authors, 2020

Based on our study, each satellite images were classified in 8 classes which are orderly mangrove forest, salt field, hills, homestead vegetation, built-up area, agricultural land, water bodies, and beach which are listed below with their training sample as well as ground control points -

Table 2: Based on LULC each satellite images were following categories

| Class | Subclass | Training sample x 9 pixels | Ground Control Points (GCP) |
|-------------------------|-----------------------------|----------------------------|-----------------------------|
| 1. Mangrove forest | 1.1 Natural Mangrove Forest | 10 | 4 |
| | 1.2 Planted Mangrove Forest | | |
| 2. Salt field | 2.1 Salt bed | 15 | 9 |
| 3. Hills | 3.1 Hilly area | 9 | 2 |
| 4. Homestead vegetation | 4.1 Homestead vegetation | 8 | 7 |
| | 4.2 Plantations | | |
| 5. Built up area | 5.1 Homestead | 13 | 11 |
| | 5.2 Constructed area | | |
| 6. Agricultural land | 6.1 Fallow land | 7 | 5 |
| | 6.2 Crop land | | |

| Class | Subclass | Training sample x 9 pixels | Ground Control Points (GCP) |
|-----------------|---------------------------------------|-------------------------------|--------------------------------|
| 7. Water bodies | 7.1 Pond 7.2 Lagoon | 22 | 6 |
| 8. Beach | 8.1 Tidal zone 8.2 Intertidal zone | 5 | 3 |

Source: ERDAS IMAGINE® Tour Guides™, (2006). Norcross, Georgia: Leica Geosystems Geospatial Imaging, LLC

Overall classification accuracy was evaluated by a confusion matrix. Besides, the overall accuracy, user's accuracy, producer's accuracy, and kappa statistics are used for the accuracy assessment. As the study is based on both primary and secondary data, the accuracy assessment was verified by the field observation. Not only are those, for better evaluation of the classes which were orderly organized and interpreted here are analyzed by photo-interpretation techniques through Google Earth Pro.

By analyzing the LULC pattern for 2000, 2005, 2010, 2015, 2020 a confusion matrix (8*8) had obtained through Markov analysis. Using the confusion matrix, the probability of changing can be estimated. (Hamad, 2018). From the cross-tabulation matrix combined with the cellular automata and transition probability matrix which is commonly known as CA Markov is used here for predicting the land use land cover of 2050 for Maheshkhali Island based on 2000-2010 matrix and 2010-2020 matrix.

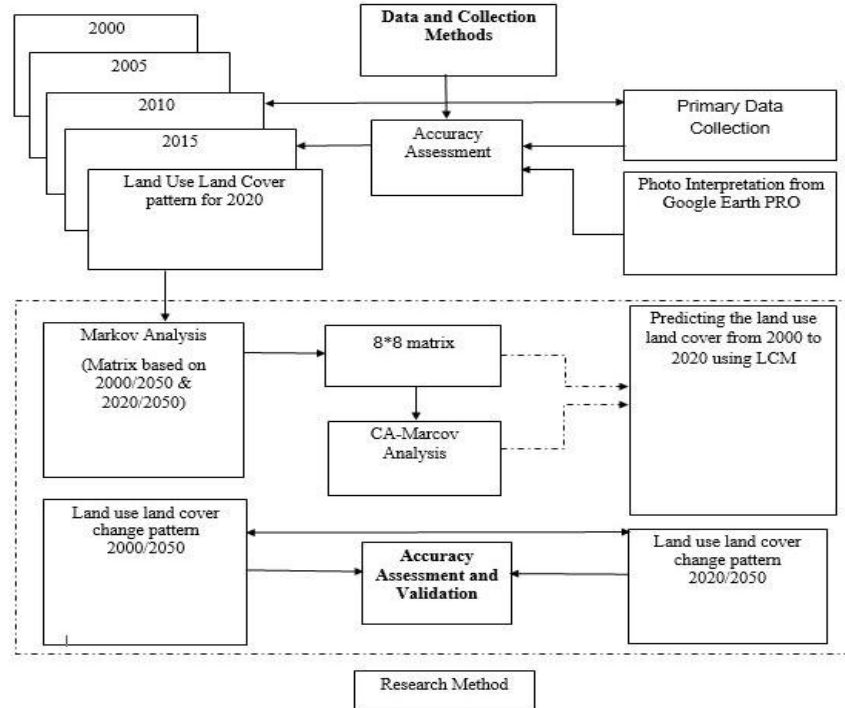


Figure 2: Conceptual framework of the study.

Source: Made by authors, 2020

Here, is the land use land cover distribution map which is acquired from the analysis of Landsat images. Each color represents the distribution of the area of each classified LULC which are for five different periods (2000, 2005, 2010, 2015, 2020).

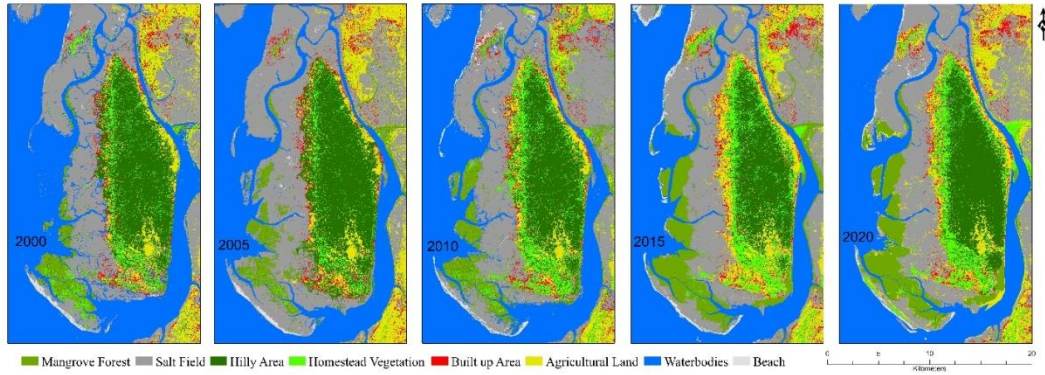


Figure 3: LULC distribution map for Maheshkhali Island of five different periods.

Source: Compiled by authors, 2020

The overall distribution of area for this studied year of Maheshkhali Island is shown in hectares as a data table according to years from where we can analyze the pattern of changes of the LULC over time.

Table 3: Temporal distribution in hectares of each LULC class

| LULC | 2000 | 2005 | 2010 | 2015 | 2020 |
|----------------------|----------|---------|----------|----------|----------|
| Mangrove Forest | 2753.37 | 2923.16 | 3534.33 | 4277.10 | 4912.83 |
| Salt Field | 8380.05 | 8466.75 | 8459.91 | 9574.34 | 10268.73 |
| Hills | 6467.38 | 6423.39 | 6429.80 | 6313.29 | 6100.92 |
| Homestead Vegetation | 1640.78 | 1926.16 | 2266.99 | 1962.14 | 2071.39 |
| Built-Up Area | 1186.11 | 1428.57 | 1763.47 | 1977.28 | 2187.47 |
| Agricultural Land | 5195.72 | 4971.47 | 4651.14 | 4453.72 | 4238.61 |
| Water Bodies | 10182.10 | 9823.77 | 9568.82 | 9377.24 | 8979.24 |
| Beach | 923.13 | 868.53 | 651.01 | 579.7 | 527.15 |
| Total | 36728.64 | 36831.8 | 37325.47 | 38514.81 | 39286.34 |

Source: Made by authors, 2020

3.0 LULC Change Analysis using CA-Markov

3.1 The Markov Model of LULC Change

The Markov model is a framework that provides a land-use simulation of inter-temporal land use shifts and analyzes future use of land. Burnham in 1973 first used the model for the southern Mississippi alluvial valley (Burnham, 1973). In the Markov model, specific land-use patterns are segmented into different classes and they are observed for a specific

time in the past and then summarized in a transition matrix. Using that matrix, it is calculated the probability of shifting for the future time frame which is known as transition probability matrix (Burnhum, 1973).

The calculation of the shifting of the land use change can be calculated through this equation-

$$S(t, t+I) = P_{ij} \times S(t)$$

Here, S is the system status, t is the system status for time initial period and $t+I$ is the system status of desired period, and these are calculated like this-

$$= \|P_{ij}\| = \begin{vmatrix} P_{1,1} & P_{1,2} & \dots & P_{1,N} \\ P_{2,1} & P_{2,2} & \dots & P_{2,N} \\ \dots & \dots & \dots & \dots \\ P_{N,1} & P_{N,2} & \dots & P_{N,N} \end{vmatrix}$$

$$(0 \leq P_{ij} \leq 1)$$

P_{ij} stands for the probability matrix which is calculated from initial state i to desired state j . A probability near 0 recommends the low transition where 1 represents the high (Kumar et al. 2014 and Behera et. all 2012).

3.2 The CA Markov-Chain Model (CA-MCM)

There is numerous model to operate analysis of the shifting land use in terms of inter-temporal location, But in the field of land use modeling researches, Cellular Automata is the most common modeling which is able to simulate and predict the changes (Batty and Xie, 1994 and Clarke and Gaydos 1998). A grid of automata only becomes the CA when the state of the neighboring cell defines the set of the input cell (Jamal et. all., 2011).

In the CA-Markov model, the Markov chain helps to analyze inter-temporal land shifting through a two-dimensional probability matrix, and this model is examined through using the three parameters k_{nor} , $k_{location}$ and $k_{quantity}$ of kappa statistics (Pontius, R.G 2000). According to Eastman 0.80 is the satisfactory result of future prediction (Eastman, J.R 2006) and if the value is more than 0.80 describes a well-defined simulation.

4.0 Results and Discussion

4.1 Accuracy Assessment

For different LULC class of Maheshkhali island producer's accuracy, user's accuracy is varied for different time period. From the table 4 shows that overall accuracy is 87, where overall kappa statistics is 0.87 respectively.

Table 4: Accuracy assessment of LULC class for different time period

| Land Use/Cover | 2001 | | 2005 | | 2010 | | 2015 | | 2019 | |
|-------------------------|------|----|------|----|------|----|------|----|------|----|
| | P | U | P | U | P | U | P | U | P | U |
| Mangrove Forest | 87 | 89 | 83 | 89 | 88 | 89 | 88 | 90 | 89 | 87 |
| Salt Field | 89 | 87 | 87 | 89 | 88 | 89 | 89 | 88 | 88 | 85 |
| Hills | 81 | 87 | 84 | 87 | 81 | 87 | 88 | 88 | 84 | 87 |
| Homestead Vegetation | 88 | 88 | 89 | 87 | 90 | 87 | 85 | 83 | 86 | 85 |
| Built-Up Area | 89 | 87 | 87 | 89 | 84 | 86 | 87 | 89 | 89 | 88 |
| Agricultural Land | 83 | 87 | 87 | 88 | 82 | 83 | 81 | 88 | 86 | 87 |
| Water Bodies | 85 | 87 | 88 | 87 | 89 | 88 | 89 | 87 | 87 | 85 |
| Beach | 87 | 88 | 83 | 88 | 88 | 88 | 88 | 87 | 84 | 89 |
| Overall accuracy | 87 | | 87 | | 87 | | 87 | | 87 | |
| Overall Kappa Statistic | 0.87 | | 0.87 | | 0.87 | | 0.87 | | 0.87 | |

Source: Made by authors, 2020

** P= Producer’s accuracy and **U= User’s accuracy.

4.2 LULC Change Analysis using LCM and CA Markov

All classes in Maheshkhali Island can be analyzed using the summary of the probability matrix and land change modeler. Row categories are characterized by LULC classes in 2000 where column categories characterized the LULC of 2010. The cross-tabulation matrices are represented in table-5 for the changing probability of 2000-2010 and in table-6 for the changing probability of 2010-2020. Deducting the data from the total column of each group achieves the gain whereas deducting the data from the total row for each group achieves the loss.

In the table, the data illustrates that for the specific time period changes took place in all classes which are in the first scenario 2000 to 2010 for 10 years. Here, the probability of remaining mangrove forest to mangrove forest 14.07%, the probability of changing mangrove forest to salt field 17.78%, mangrove forest to hills 17.93%, mangrove forest to built-up area 5.83%, mangrove forest to agricultural land 5.20%, mangrove forest to water bodies 19.90%. So, the probability of loss for its own characteristics of mangrove forest is 85.93% but from the other classes, the probability of gaining the mangrove forest is 83.52%.

Table 5: Transition probability matrix during 2000-2010

| Changing from 2000 | Probability of Changing by 2010 | | | | | | | | Subtotals | |
|----------------------|---------------------------------|------------|--------|---------|---------------|------------|--------------|--------|-----------|--------|
| | Mangrove Forest | Salt Field | Hills | H. Veg. | Built-Up Area | Agri. Land | Water Bodies | Beach | Total | Loss |
| Mangrove Forest | 0.1407 | 0.1778 | 0.1793 | 0.1749 | 0.0583 | 0.0520 | 0.1990 | 0.0180 | 1.00 | 0.8593 |
| Salt Field | 0.1278 | 0.1964 | 0.1052 | 0.0984 | 0.0549 | 0.0413 | 0.3494 | 0.0268 | 1.00 | 0.8036 |
| Hills | 0.1238 | 0.1721 | 0.1852 | 0.1722 | 0.0705 | 0.0753 | 0.1821 | 0.0189 | 1.00 | 0.8184 |
| Homestead Vegetation | 0.1353 | 0.1747 | 0.1882 | 0.1876 | 0.0603 | 0.0560 | 0.1807 | 0.0172 | 1.00 | 0.8124 |
| Built-Up Area | 0.1001 | 0.1637 | 0.1897 | 0.1543 | 0.0921 | 0.1174 | 0.1608 | 0.0218 | 1.00 | 0.9079 |
| Agricultural Land | 0.0968 | 0.1590 | 0.1985 | 0.1583 | 0.0968 | 0.1286 | 0.1415 | 0.0206 | 1.00 | 0.8714 |
| Water Bodies | 0.1367 | 0.1968 | 0.1031 | 0.0991 | 0.0492 | 0.0320 | 0.3592 | 0.0239 | 1.00 | 0.6408 |
| Beach | 0.1147 | 0.2087 | 0.0857 | 0.0797 | 0.0574 | 0.0397 | 0.3745 | 0.0396 | 1.00 | 0.9604 |
| Total | 0.9759 | 1.4492 | 1.2349 | 1.1245 | 0.5395 | 0.5423 | 1.9472 | 0.1868 | | |
| Gain | 0.8352 | 1.2528 | 1.0497 | 0.9369 | 0.9079 | 0.4137 | 1.588 | 0.1472 | | |

Source: Made by authors, 2020

Like the mangrove forest, the probability of remaining salt field to salt field 19.64%, the probability of future changes for the salt field to mangrove forest 12.78%, salt field to hills 10.52%, and salt field to homestead vegetation 9.84%, salt field to built-up area 5.49%, salt field to agricultural land 4.13%, salt field to water bodies 34.94%, salt field to beach 1.80% and so on for the other LULC.

In the second period (2010-2020), the probability of change, for example, the probability of remaining mangrove forest to mangrove forest 5.43%, the probability of changing mangrove forest to salt field 18.76%, mangrove forest to hills 17.54%, mangrove forest to built-up area 5.46%, mangrove forest to homestead vegetation 13.58%, mangrove forest to agricultural land 26.59%, mangrove forest to water bodies 12.04%. So, the probability of loss for its own characteristics of mangrove forest is 94.57% but from the other classes, the probability of gaining the mangrove forest is 34.83%.

Table 6: Transition probability matrix during 2010-2020

| Changing from 2010 | Probability of Changing by 2020 | | | | | | | | Subtotals | |
|----------------------|---------------------------------|------------|--------|----------------------|---------------|------------|--------------|--------|-----------|-------|
| | Mangrove Forest | Salt Field | Hills | Homestead Vegetation | Built-Up Area | Agri. Land | Water Bodies | Beach | Total | Loss |
| Mangrove Forest | 0.0543 | 0.1876 | 0.1754 | 0.1358 | 0.0546 | 0.2659 | 0.1204 | 0.0060 | 1.00 | 0.946 |
| Salt Field | 0.0382 | 0.2256 | 0.1398 | 0.1082 | 0.0629 | 0.2778 | 0.1392 | 0.0083 | 1.00 | 0.774 |
| Hills | 0.0504 | 0.1330 | 0.2823 | 0.1747 | 0.0495 | 0.2843 | 0.0233 | 0.0025 | 1.00 | 0.492 |
| Homestead Vegetation | 0.0471 | 0.1734 | 0.2442 | 0.1728 | 0.0509 | 0.2680 | 0.0394 | 0.0042 | 1.00 | 0.827 |
| Built-Up Area | 0.0471 | 0.1720 | 0.2158 | 0.1356 | 0.0604 | 0.3204 | 0.0496 | 0.0047 | 1.00 | 0.939 |
| Agricultural Land | 0.0451 | 0.1224 | 0.2724 | 0.1561 | 0.0556 | 0.3278 | 0.0183 | 0.0022 | 1.00 | 0.672 |
| Water Bodies | 0.0325 | 0.1392 | 0.0545 | 0.1561 | 0.0546 | 0.1654 | 0.4991 | 0.0104 | 1.00 | 0.500 |
| Beach | 0.0336 | 0.1816 | 0.0962 | 0.0744 | 0.0602 | 0.2278 | 0.3166 | 0.0095 | 1.00 | 0.990 |
| Total | 0.3483 | 1.3348 | 1.4806 | 1.1137 | 0.4487 | 2.1374 | 1.2059 | 0.0478 | | |
| Gain | 0.2940 | 1.1090 | 1.1983 | 0.9409 | 0.3883 | 1.8096 | 0.7068 | 0.0383 | | |

Source: Made by authors, 2020

The transition probability matrices and transition area matrices are developed for predicting the year 2050 using images of 2000 and 2010 of LULC maps concerning with analyzing the changing pattern of 2000-2020 and another prediction for 2050, analyzing the LULC maps of 2010-2020 using the transition probability matrices and transition area matrices of 2020.

Table 7: Transition probability matrix during 2000-2020

| Changing from 2000 | Probability of Changing by 2020 | | | | | | | | Subtotals | |
|----------------------|---------------------------------|------------|--------|----------------------|---------------|------------|--------------|--------|-----------|--------|
| | Mangrove Forest | Salt Field | Hills | Homestead Vegetation | Built-Up Area | Agri. Land | Water Bodies | Beach | Total | Loss |
| Mangrove Forest | 0.3972 | 0.1509 | 0.2289 | 0.173 | 0.0104 | 0.0012 | 0.0377 | 0.0007 | 1 | 0.6028 |
| Salt Field | 0.0494 | 0.3023 | 0.0195 | 0.0436 | 0.0636 | 0.0149 | 0.4538 | 0.0528 | 1 | 0.6977 |
| Hills | 0.1033 | 0.1504 | 0.3527 | 0.2189 | 0.0776 | 0.0789 | 0.0172 | 0.0008 | 1 | 0.6473 |
| Homestead Vegetation | 0.1347 | 0.1321 | 0.2489 | 0.4505 | 0.0165 | 0.0049 | 0.0122 | 0.0003 | 1 | 0.5495 |
| Built-Up Area | 0.0153 | 0.1121 | 0.2147 | 0.0758 | 0.2892 | 0.2624 | 0.0071 | 0.0234 | 1 | 0.7108 |
| Agricultural Land | 0.0114 | 0.069 | 0.2164 | 0.0698 | 0.1715 | 0.4431 | 0.0055 | 0.0132 | 1 | 0.5569 |
| Water Bodies | 0.1247 | 0.1891 | 0.0096 | 0.0173 | 0.0229 | 0.0012 | 0.6254 | 0.0098 | 1 | 0.3746 |
| Beach | 0.0135 | 0.3628 | 0.0027 | 0.0077 | 0.0582 | 0.0002 | 0.2229 | 0.3321 | 1 | 0.6679 |
| Total | 0.8495 | 1.4687 | 1.2934 | 1.0566 | 0.7099 | 0.8068 | 1.3818 | 0.4331 | 1 | |
| Gain | 0.4523 | 1.1664 | 0.9407 | 0.6061 | 0.4207 | 0.3637 | 0.7564 | 0.101 | | |

Source: Made by authors, 2020

The simulation for 2000-2020 showed that, the probability of remaining mangrove forest to mangrove forest 39.72% where the probability of changing mangrove forest to salt field 15.09%, mangrove forest to hills 22.89%, mangrove forest to built-up area 1.04%, mangrove forest to homestead vegetation 1.73%, mangrove forest to agricultural land 0.12%, mangrove forest to water bodies 3.77%. So, the probability of loss for its characteristics of mangrove forest is 60.28% but from the other classes, the probability of gaining the mangrove forest is 45.23%.

Here, presented two simulations where 2050 is predicted based on the matrix of 2000-2010 and another simulation presented for the matrix of 2010-2020. Maheshkhali Island is the depositional landform (Islam, 2011) for that landform increasing its area every year wherein 2000 it was only 36728.65 hectares and it becomes 39286 hectares in 2020 which presents a clear comparison between the two simulations that matrix of 2000 predicts 44837 hectares for 2050 and another matrix of 2020 predicts 46439 hectares for 2050.

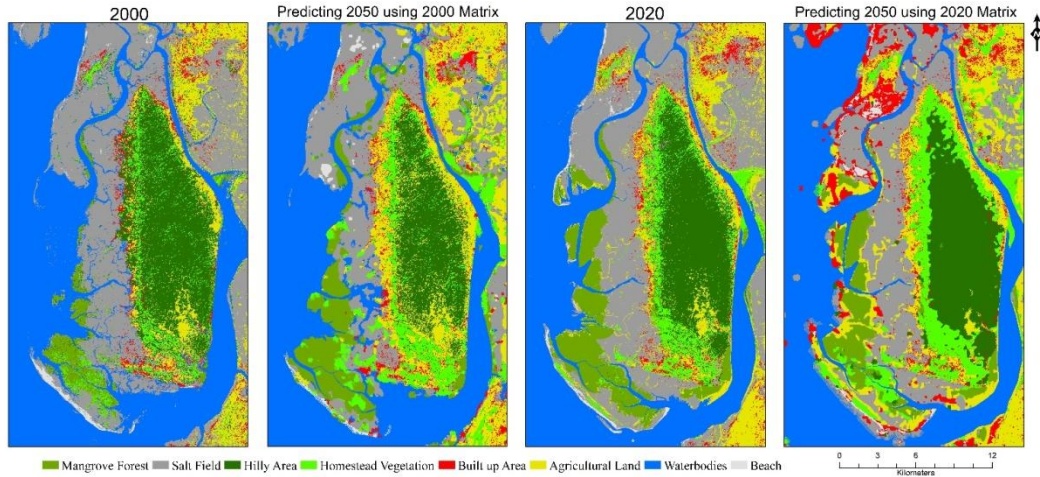


Figure 4: Predicted LULC of Maheshkhali for 2050

Source: Made by authors, 2020

Table 8 illustrates the area statistics for all classes' categories for different periods. From the data the results show that there is a continuous increasing in mangrove forest which supports the accretion characteristics of Maheshkhali.

Salt field cultivation increased slightly from 2000-2020 and then decreased in 2050. Hills are decreasing slightly where in 2000 it was 6467.38 ha, it decreased in 2020 (6100 ha). Homestead vegetation pattern increased over time with the enhancement of built up area and development activities. Agricultural land, water bodies and beach are gradually decreased over time.

Table 8: Area statistics for actual LULC classes for different projected years.

| LULC | LULC 2000 (hectares) | LULC 2020 (hectares) | LULC 2000-2050 (hectares) | LULC 2020-2050 (hectares) |
|----------------------|----------------------|----------------------|---------------------------|---------------------------|
| Mangrove Forest | 2753.37 | 4912.83 | 6671.93 | 6972.87 |
| Salt Field | 8380.06 | 10268.73 | 7078.76 | 7363.64 |
| Hills | 6467.38 | 6100.92 | 4611.23 | 4711.23 |
| Homestead Vegetation | 1640.78 | 2071.39 | 5340.89 | 7140.89 |
| Built-Up Area | 1186.11 | 2187.47 | 4014.71 | 8714.71 |
| Agricultural Land | 5195.72 | 4238.615 | 7798.1 | 3298.1 |
| Water Bodies | 10182.1 | 8979.24 | 7913.63 | 7813.03 |
| Beach | 923.13 | 527.15 | 1509.03 | 425.03 |
| Total | 36728.65 | 39286.38 | 44837.69 | 46439.50 |

Source: Made by authors, 2020

4.3 Model Validation

To validate the model, there have been drawn up a comparison between actual land use land cover and predicted land use land cover. If K_{IA} values draw up a better comparison between actual land use land cover and predicted land use land cover, it may easily mention that the model is well designed (Hamad et. all., 2018).

Table 9: κ values for 2000 and 2020 to validate the model

| 4. κ Indicators | 2000 | 2020 |
|---------------------------|--------|--------|
| κ_{no} | 0.8644 | 0.8935 |
| $\kappa_{location}$ | 0.8210 | 0.8007 |
| $\kappa_{locationstrata}$ | 0.8210 | 0.8007 |
| $\kappa_{standard}$ | 0.8200 | 0.8730 |

Here, all values are more than 80% which indicates that accuracy assessment was sufficiently accurate. From the statistics, the κ_{no} for 2000 is 0.8644 where it is 0.8935 for 2020. The $\kappa_{location}$ is 0.8210 for 2000 and 0.8007 for 2020. The value of $\kappa_{locationstrata}$ is 0.8210 for 2000 where 0.8007 for 2020. Last, $\kappa_{standard}$ value is 0.8200 for 2000 and 0.8730 for 2020. These all values are more than 80% which provides a good accuracy assessment for this model (Eastman, 2006).

5.0 Conclusion

In recent years, because of development projects accomplished by the Govt. Maheshkhali Island has undergone rapid LULC changes which are clearly sighted in this paper. According to the result of the classification, LULC of the different projected year

displayed that there's an increment of areas of Maheshkhali over time. The overall simulation shows that over time (2000-2020), agricultural land, hills, beach, and water bodies decreased whereas other classes are increased and using the simulation derived from the matrix, showed that in 2050 salt field, hills, beach and water bodies will decrease because of development projects as well as human influence with rapid population growth whereas other classes will increase because of land demands over time. From geographical perspectives as this island has a significant value for its unique morphological characteristics, this study may help the Govt. for planning and management and detect the changes gone through on the island over time.

References

- Batty, M. and Xie, Y., 1994. From cells to cities. *Environment and planning B: Planning and Design*, 21. *Possible Urban Automata*, Pp 31-48. <https://doi.org/10.1068/b240175>
- Baker, R.G., 1989. A review of models of landscape change. *Landscape Ecol.*, 2 (1989), pp. 111-133.
- Behera, D.M., Borate, S.N., Panda, S.N., Behera, P.R., Roy, P.S., 2012. Modelling and analyzing the watershed dynamics using Cellular Automata (CA)-Markov model: a geo-information based approach. *J. Earth Syst. Sci.* 2012, 121, 1011–1024.
- Burnham, B.O., 1973. Markov intertemporal land use simulation model. *J. Agric. Appl. Econ.* 1973, 5, 253–258.
- Clarke, K.C. and Gaydos, L.J., 1998. Loose-coupling a cellular automation model and GIS: long-term urban growth prediction for San Francisco and Washington/Baltimore. *Geographical Information Sciences*, 12(7), 699-714.
- Eastman, J.R., 2006. *IDRISI Andes Tutorial*, Clark Labs: Worcester, MA, USA, 2006.
- ERDAS IMAGINE® Tour Guides™, 2006. Norcross, Georgia: Leica Geosystems Geospatial Imaging, LLC.
- Gillanders, S. N., Coops, N. C., Wulder, M. A., and Goodwin, N. R., 2008. Application of landsat satellite imagery to monitor land-cover changes at the Athabasca Oil Sands, Alberta, Canada. *Canadian Geographer*, 52(4), 466–485. <https://doi.org/10.1111/j.1541-0064.2008.00225.x>
- Han, H., Yang, C., and Song, J., 2015. Scenario simulation and the prediction of land use and land cover change in Beijing, China. *Sustainability (Switzerland)*, 7(4), 4260–4279. <https://doi.org/10.3390/su7044260>
- Islam, M.A., Majlis A.B.K and Rashid, M.B., 2011. Changing face of Bangladesh coast, *The Journal of Noami*, Vol.28, Number-1, pp 1-13(June).
- Jamal et. al., 2011. Tracking dynamic land-use change using spatially explicit markov chain based on cellular automata: The case of Tehran.
- Kumar, S., Radhakrishnan, N., Mathew, S., 2014. Land use change modelling using a markov model and remote sensing. *Geomat. Nat. Hazards Risk* 2014, 5, 145–156.
- Liping, C., Yujun, S., and Saeed, S., 2018. Monitoring and predicting land use and land cover changes using remote sensing and GIS techniques: a case study of a hilly area, Jiangle, China. *PLoS ONE*, 13(7), 1–23. <https://doi.org/10.1371/journal.pone.0200493>.

- Majlis, A.B.K., Islam, Hossain, Ahsan, 2013. Protected to open basin depositional system: an approach for the Late Quaternary Evolution of the Maheshkhali-Kutubdia Coastal Plain, Bangladesh.
- Mondal. S., Sharma, N., Garg, P.K., Kappas, M., 2016. Statistical independence test and validation of CA Markov land use land cover (LULC) prediction results, *The Egyptian Journal of Remote Sensing and Space Science*, Volume 19, Issue 2, December 2016, Pages 259-272.
- Muller, M.R., Middleton, J., 1994. A markov model of land-use change dynamics in the Niagara region, Ontario, Canada, *Land-scape Ecol.*, 9 (2) (1994), pp. 151-157.
- Pontius, R.G., 2000. Quantification error versus location error in comparison of categorical maps. *Photogramm. Eng. Remote Sens.* 2000, 66, 1011–1016.
- Pontius, R.G., 2003. Statistical methods to partition effects of quantity and location during comparison of categorical maps at multiple resolutions. *Photogram. Eng. Rem. Sens.*, 68 (10) (2002), pp. 1041-1049.
- Rahel, H., Balzter, H., and Kolo, K., 2018. Predicting Land Use/Land Cover Changes Using a CA-Markov Model under Two Different Scenarios.

Water Policy Improvement and IWRM Implementation Effectiveness in Bangladesh

Ubaydur Rahaman Siddiki*

Abstract: Integrated Water Resources Management (IWRM) has been implemented to solve the water sector crisis in Bangladesh since the early 1990s. However, IWRM implementation is being undermined in various ways by environmental, developmental and administrative challenges. To reduce these challenges and increase the effectiveness of IWRM implementation, the Government of Bangladesh (GoB) has sought to ensure enabling environment. Following this, Water Act (2013) and National Water Policy (NWPo, 1999) is being formulated and implemented. For the convenience of discussion, Water Act is being considered as the latest water policy. Although water policy has been prepared for the betterment of the water sector in Bangladesh, the existing contradictions in water policy hinder its implementation. In this paper, Policy Network Analysis (PNA) has been used to explore how the existing inconsistencies in the water policy affect the policy implementation. Improving the water policy will reduce the existing contradictions and increase IWRM implementation effectiveness. Using document analysis and semi-structured interviews, this paper provides a comprehensive understanding of improving water policy to reduce existing inconsistencies for increasing the efficacy of upcoming water projects favouring IWRM implementation in Bangladesh. The findings show that the absence of vital water actors and flawed policy formulation is responsible for creating contradictions and inconsistency in water policy contradictions, which has increased due to more interdependency but lack of coordination and less cooperation. Thus, improving current policy through policy review may reduce the number of existing challenges, hence increases the IWRM implementation effectiveness. Necessary strategies and measures as per network management are recommended for enhancing water policy by resolving inconsistencies, then the future water projects under IWRM will have a positive benefit.

Keywords: Water Policy, Water Act, Policy Network Analysis, IWRM, Network management

Introduction

Since Bangladesh's sustainable development is involved with the water sector, a comprehensive mitigation strategy is needed to ensure adequate water resource management (Gain et al., 2017a). Like many other developing countries, following recommendations of several summits and conferences (e.g., United Nations Water Conference, 1977; The Dublin Conference on Water and Environment, 1992; Rio Summit on Environment and Development, 1992), Bangladesh commenced Integrated Water Resources Management (IWRM) in the early 1990s with diverse outcomes (Gain et al., 2017a; WARPO, 2015; Chowdhury, 2010; Rahaman and Varis, 2009; Biswas, 2008b; Das Gupta et al., 2005). However, its implementation in Bangladesh has been hampered due to environmental, developmental and administrative challenges (BIDS, 2014). The Government of Bangladesh (GoB) has developed a significant legislative environment to enable IWRM, including the Water Act (2013) and the National Water Policy (NWPo, 1999) (World Bank, 2017; WARPO, 2015; MoWR, 2013; MoEF, 2012). The NWPo sets the ground rules for allocating water to different users, water rights, pricing, and environmental safety (Gain et al., 2017b; Rasheed, 2011; WARPO, 2001).

* Associate Professor, Department of Geography and Environment, Jahangirnagar University, Bangladesh
Email: ursgeo@juniv.edu

The Water Act creates an environment for integrated water sector development through proper distribution, management, conservation and protection of water resources (WARPO, 2015; MoWR, 2013; Muller, 2010; Cook, 2010; MoP, 2010). Despite this and the positive intentions of the GoB in developing water policy (NWPo and Water Act), the existing contradictions in water policy affect the effective IWRM implementation. So, enhancing the water policy development process will reduce the number of inconsistencies, increasing IWRM implementation effectiveness.

There is ample opportunity to improve existing water policy using the Network Management Approach (NMA) in the overhead view. Although water policy development and implementation related contradictions have been researched and reviewed at various times, there is no significant research on how the existing water policy of Bangladesh can be improved by network management. There is no substantial research on making the current water policy more standard and acceptable, especially considering the physical and environmental, socio-economic, political and administrative issues. Given the above points, this paper provides some recommendation as per network management.

Using Policy Network Analysis (PNA), considering the impact of existing contradictions on IWRM implementation, this paper shows how water policy can be improved using a network management approach. The specific objectives of the paper are:

- i. To explore the existing contradictions in the water policy and how they are created.
- ii. To find out what kind of measures and strategies the network management can offer to improve existing water policy for increasing the effectiveness of the IWRM implementation.

This paper first provides a brief description of the IWRM and Policy Network Analysis (PNA) followed by the research method on which the whole paper is done. Before critically analysing how to improve water policy using Network Management Approach (NMA), this paper explores the existing contradictions in water policy that affect the IWRM implementation. Following this, a discussion of how potential strategies and measures per network management are discussed, highlighting how actor's activities help improve the water policy development process. Similarly, how to make policy rules and regulations more reliable and project implementation friendly through network management. Also, how to ensure the power balance of actors by reasoning resource distribution using network management. A concluding remark has finally been made through the summarising of these issues.

IWRM in Bangladesh

IWRM is best understood as an umbrella concept that encompasses many principles that enable a holistic and coordinated management approach across the different aspects of water resources systems (Gain et al., 2013; Foster and Ait-Kadi, 2012). The Global Water Partnership (GWP) has defined the IWRM "*a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare equitably without compromising the sustainability of vital ecosystems*" (GWP, 2000: p. 22), IWRM is an open and flexible

approach that can handle multiple and cross-sectoral stakeholders to solve specific water challenges (Benson et al., 2015; Gain et al., 2013; Bandaragoda and Babel, 2010; Biswas and Tortajada, 2010; Rahaman and Varis, 2009; Biswas et al., 2005).

To determine the definition of IWRM, GWP highlights three principles (e.g., considering economic efficacy in case of water use; equity and social justice; and environmental sustainability) that together act as the overall IWRM framework (Benson et al., 2015; CSIRO, 2014; Bandaragoda and Babel, 2010; Biswas et al., 2005; Chadwick and Datta, 2003). Based on these three principles, IWRM defines three 'pillars' to implement IWRM effectively (Biswas, 2008a; GWP, 2000). The first pillar is the *enabling environment* which is the focus of this paper. Enabling environment supports IWRM implementation by making plans, policies, and strategies to ensure financial structure and legislative framework. Allowing the environment seeks to safeguard the interests of all actors involved in the water sector through protecting their rights and assets (Alam and Quevauviller, 2014; Das Gupta et al., 2005; Albert, 2001). It can create (or hinder) opportunities for the other two IWRM pillars, *institutional framework* and *management instruments*, highlighting the importance of the enabling environment for effective IWRM. The second pillar, *institutional* structure, relates to the organisations and networks developed to implement IWRM. The third pillar, *management instruments*, capture the discrete methods, processes, and procedures that play a crucial role in designing and making policy-makers (GWP IWRM Toolbox, 2001). The purpose of the policy and Act as part of the enabling environment is to support the IWRM implementation. The problems and inconsistencies resulting from creating water policy and Act in the inefficient development process must impact IWRM.

With the future development of Bangladesh inextricably linked with the water sector, Bangladesh adopted IWRM in the early 1990s with mixed results (Gain et al., 2017b; Chowdhury, 2010; Biswas, 2008b; Das Gupta et al., 2005; Rahaman and Varis, 2005). Considering the need for IWRM in the water sector, the GoB has developed many policies, programmes and procedures to ensure enabling environment that enables IWRM implementation properly (Debnath, 2016; Dewan et al., 2015; GoB, 2013). Development of both the policy and Act was a significant step in providing an appropriate water governance system, with several IWRM projects completed and many ongoing (see <https://www.bwdb.gov.bd>; <http://www.warpo.gov.bd>). The Act provides a strong basis upon which the NWPo can support IWRM by granting water resource rights to user groups, organisations, and associations, facilitating the best possible use of water resources and nature conservation (Alam, 2014). In addition to the Act, several national development goals (e.g., poverty reduction, food security, gender equality, water pricing, access to safe water, environmental sustainability, etc.) have been considered in other substantial GoB policies, including the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), the National Water Management Plan (NWMP) and the Sixth Five-year Plan (WARPO, 2015; MoWR, 2013; Muller, 2010; Cook, 2010; MoP, 2010), further strengthening the enabling environment for effective IWRM. While the collective impact of these multiple policies on IWRM is essential, this paper focuses on the NWPo and Water Act to provide a nuanced understanding of actors' influence on the policy and act development and support improvements in Bangladesh IWRM enabling environment. Policy network Analysis (PNA) will help explore the actor's impact in the development process of policy and Act; and provide insights into how involved actors contribute to, or hinder, the development process and consequently IWRM implementation in Bangladesh.

Policy Network Analysis (PNA)

A policy network is a form of interest group intermediation focusing on the relationship between the state and stakeholders (Arts and Van Tatenhove, 2006; van Tatenhove et al., 2000). Policy networks involve relatively stable patterns of interaction between government and interest groups who share and exchange their skills, experiences and resources in the network (Börzel, 1998; Rhodes, 1997; Kikert et al., 1997). PNA can contribute to policy problem definition and policy instrument identification by analysing the existing contradictions of the policy (Alam and Quevauviller, 2014; Chowdhury, 2010; Chadwick and Datta, 2003; Benson, 1982). The policy networks concept was introduced in public policy in the mid-1970s through Scharpf's (1978) work. Following this, the popularity of this concept continues to proliferate in the policymaking process (Ball, 2012; Ball and Junemann, 2012; Klijn, 2009; Kikert et al., 1997; Marsh and Rhodes, 1992a). Given this, PNA provides a handy analytical tool to explain the nature of links and interactions among actors and a new technique to manage policy formulation processes within complex interactive situations (Klijn, 2005) such as IWRM.

Marsh and Rhodes (1992) argue that characteristics analysis of the policy network under PNA shows the possible difficulties in implementing that policy. A clear view of whether policy development processes have anything to do with these difficulties. Three key characteristics of policy network analysis are helpful to analyse actors and how they support or hinder policy development processes: a) actors involved, b) rules and regulations; and c) power relations and resources dependencies within networks (Rhodes, 2006; Waarden, 1992; Rhodes and Marsh, 1992; Rhodes, 1990; Rhodes, 1986). Each of these is described in further detail below.

Actors within the policy networks

A policy network consists of multiple actors who all have their own goals and strategies (Marsh and Smith, 2000). The policy results from interactions between actors, resulting in complex interactions and bargaining processes (Gage and Mandell, 1990; Rhodes, 1988; Benson, 1978, 1982). Within any given policy network, actors work together to consolidate negotiating power, leverage resources and navigate interdependencies to steer policy towards their preferences. As such, policy networks are characterised by the actors and their relations (Klijn et al., 1995).

Actor's characteristics affect the policy development and implementation process (Peterson, 2003). The policy development process is better through appropriate actor selection, affecting implementing that policy (Börzel, 1998). Challenges can be created during any policy development process due to the absence of actors relevant to the networks and less cooperation and unrealistic bargaining amongst actors (Klijn et al., 1995). Actor performances can be assessed at the policy outcome level by analysing how actors support the development process to produce high-quality policy. Also, the development process was hampered due to left out interests (Fischer and Miller, 2006; van Tatenhove et al., 2000; Marsh and Smith, 2000). The role of the actor's in policy development has a far-reaching impact on that policy implementation (Klijn and Koppenjan, 2000). Even if there are proper rules and regulations, such policy output is not sound even the kind of work done following this policy.

Rules and Regulations within the policy networks

Relevant organisations make some rules and regulations for achieving the goals and objectives of the policy. Rules can be formal or informal; for example, they could be a set of guidelines that have little or no consequences depending on the person enforcing them (Klijn and Koppenjan, 2000). The rules of a network are not fixed but can change in response to different situations (Koppenjan and Klijn, 2004). Regulation is a type of restriction created by the authority that helps the public to follow. The regulation provides agencies' frameworks when developing rulemakings by setting guidelines for developing and implementing policy or Act (Megdal et al., 2017). Rules and regulations guide the actor's behaviour, including resource distribution and interactions between actors (Marsh and Smith, 2001; Klijn et al., 1995). Klijn and colleagues (1995) argue that both rules and regulations can specify the mandate, power and responsibility of involved actors based on deciding policy development, adjustment and implementation stages (Waarden, 1992). The effectiveness of policy networks will be significantly impacted without the proper specification of actor mandate and responsibilities, guided by the rules and regulations (Hu et al., 2019; Tejada-Guibert et al., 2015).

Power Relations and Resource dependencies within the policy network

Typically, resources include money and knowledge (Marsh and Smith, 2000), although information can also be exchanged as a vital resource. Power is a relational concept regarding actor's ability that provide support the policy network from its development to implementation phases (Peterson, 2003; Marsh, 1998). Power distribution and resources within a network affect the policy outcome and influence how the policy develops. The success or failure of the policy development depends on the actor's ability to provide resources, what Rhodes (1986b) has termed 'power dependencies'. Though actors are mutually interdependent in terms of their aid exchanging capacity (Peterson, 2003; Waarden, 1992), the authority of resource providing refers to the power of an actor (Leroy and Arts, 2006). The wide variation in resource supply affects the policy network's power balance (Klijn and Koppenjan, 1999). Usually, providers of these primary resources dominate the network, influencing network rules and behaviour; hence the distribution of resources between actors within a system affects the policy outcomes (Leroy and Arts, 2006), with power balance among actors significant when developing effective policy. Simultaneously, the type and size of the network, together with its administrative characteristics and the degree of centralisation, can also play a vital role in shaping power relations within a network (Fischer and Miller, 2006). We can better determine the resource, mandate and responsibility, and interdependency amongst actors within the policy network with this understanding.

The paper recognises policy networks' utility better to understand the challenges within the Bangladesh water policy environment. Using the PNA framework initially developed by Marsh and Rhodes (1992), the paper focuses on the three main network characteristics: actor traits (types, numbers, interests), network rules and regulations, and actors power relations and resource distribution to develop a comprehensive and critical understanding of policy development and implementation in Bangladesh.

Data and Methods

Interviews and document analysis were both used in this study. In-depth semi-structured interviews completed with 30 water professionals and experts from government organisations (25) and NGO representatives (5). According to the PNA framework (e.g., actor types, numbers, their interests, network rules and regulations; and actors power relations and resource distribution), interviews respondents were asked how IWRM implementation is influenced by the policy and act development processes. Interviews were undertaken with water management professionals (BWDB and WARPO), and experts (CEGIS, IWM, BARSIK) lasted up to 45 minutes in duration.

In addition to interviews, documents were collected from professional water management organisations, government agencies, private institutions, relevant non-governmental organisations (NGOs), and funding bodies where appropriate. Documents include government notifications, reference book and publications, journals, national policies, statistical data, media reports etc., regarding water resources management of Bangladesh. Documents were collected directly from those institutions¹ involved in preparing both Water Policy (1999) and Water Act (2013) and working with IWRM implementation.

Thematic framework analysis of the prepared transcripts from interviews and documents was guided by the PNA approach, identifying actor characteristics, impacts of rules and regulations, examples of power relations and resource distribution, and actor dependencies and their impacts on IWRM implementation. This analysis enabled exploring PNA categories' properties and dimensions, identifying relationships between types, and uncovering different patterns between groups. To maintain the anonymity of study participants, quotes from interviewees are attributed numerically based on their place, e.g., WARPO 1, BWDB 1, CEGIS 1 etc.

Existing contradictions in water policy: What and how?

Following the PNA framework, this section discusses the existing contradictions in the latest water policy and its generalisation. Significantly, this section tries to discuss the following topics according to PNA characteristics: How actors related paradoxes are created in the policy? How the rules and regulations related contradictions came out in the policy? And finally, how power relation and dependency related contradictions happened in the policy?

Actor's role in creating a contradiction in the water policy

The executive and expert of the water sector in Bangladesh prepared the water policy without assistance from foreign experts, operational water managers or water disaster victims (BWDB, 2016, WARPO, 2015). As water regulator, officials of the Ministry of Water Resources (MoWR) were involved in the developing process from beginning to end, where WARPO and BWDB worked as supportive institutions. The development process used a top-down approach that prevented local actors from involving foreign

¹ Water Resources Planning Organization (WARPO), Local Government and Engineering Department (LGED), Bangladesh Water Development Board (BWDB), Institute of Water Modelling (IWM), Ministry of Environment and Forest (MoEF), Centre for Geographic Information Systems (CEGIS), Academic Institutions and Non-Government Organisations (NGOs).

actors' cost (World Bank, 2017). Several difficulties and inconsistencies have been created during the policy development process, as some important Bangladeshi water actors are not involved², similar to what Gain et al. (2017) found. The policy could not absorb multidimensional concepts that were the sources of few inconsistencies of policy contents (WARPO 5, interview).

The centralisation of the development policy was also identified as a blockage. The industrial and community groups generally have less opportunity to get involved in policy making and discussion in Bangladesh. In particular, despite being left out in water policy, though they are major impacted and impacting groups with water governance mechanisms (Rasheed, 2011). Political influences and pressure on individuals and departments created a closed policy development environment. Community groups, in particular, feel that they are never involved in policymaking and discussion, and even in some cases, their views, thoughts and suggestions are not taken into consideration (BARCIK 1 and CEGIS 1, interview).

Several interviewees identified inadequate actor selection as hindering the process and, consequently, policy implementation, similar to what Khadim et al. (2013) found. Actor selection affects cooperation between actors and unrealistic bargaining tendency within the network that eventually affects the policy operationalisation (Hossain and Bahauddin, 2013). An essential part of water policy development was to absorb contents from the previous water-related policy. Despite the best efforts of BWDB and WARPO, there are some contradictions in the policy content due to the absence of the representative of women and local NGOs (BARCIK 1 and CEGIS 2, interview).

The policy's acceptance would have increased if the important actors left out of the policy development process were included. Policy rules and regulations can play a vital role in minimising the contradictions that result from flawed water policy development processes.

How the rules and regulations create contradictions in the water policy

Here is a detailed discussion of how flawed policy development processes affect policy rules and regulations. Due to defective policy development, some rules and regulations remain contradictory, which has far-reaching effects on the actor's mandate and responsibility, similar to what Alam (2014) found. The water act is broadly a firm policy; however, the policy documents show some contradictions about the mandate and responsibility of the water institutions involved. This is why actors involved in the policy sometimes suffer indecision in their duties and try to impose duties on each other (Gain et al., 2017a). Waterbodies cannot function properly because the actor's responsibility and mandate are not adequately defined in the rules and regulations, even if the main waterbodies struggle to meet their obligations (World Bank, 2017; WARPO 3, 7, 12 Interview). WARPO faces some more difficulties in fulfilling its responsibility due to contradictions created during the policy development process (Alam, 2014; WARPO 9, 13 Interview).

² Department of Bangladesh Haor & Wetland Development (DBHWD), Institute of Water Modelling (IWM), Centre for Environment and Geographic Information Services (CEGIS), Department of Agricultural Extension (DoA), Bangladesh Agricultural Development Corporation (BADC), Barind Multipurpose Development Authority (BMDA), Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE); and Water and Sewerage Authority etc.

The Water Act has been formulated by absorbing and superseding all the previous water policies, which is the latest water policy of Bangladesh (GoB, 2013). Occasionally confusion over linguistic translation leads to confusion about the responsibilities described in rules and regulations (WARPO, 2015). These involved actors are trying to impose their duties on each other, in contrast to GoB (2013). This has adverse effects on policy implementation (BWDB 7 and WARPO 3, interview). The impact of developing water policy in the absence of some important water actors is reflected in the rules and regulations (Chan et al., 2016). The funny thing is that the excluded actors are somehow involved in policy implementation. Due to some highly restrictive rules and regulations, local-level water actors cannot perform their duties without the prior permission of the higher authority, even in an emergency (World Bank, 2017).

The water policy regulations provide the legal framework for the water-related organisations to provide essential services to the threshold area (Gain et al., 2015). In this case, the service may be interrupted due to policy regulations' conflict with the service provider regulations. A major water actor like Dhaka Water Supply and Sewerage Authority (DWASA)' can take the initiative to enhance the policy regulations based on data collected from affiliated organisations: (WARPO 11, interview). Rules and regulations play a vital role in policy implementation. Therefore, the existing inconsistencies in the laws and regulations usually caused by the policy development process are not reduced; the policy effectiveness will decrease. The existence of contradictory rules and regulations related to the actors' mandate and responsibility has a significant impact on the resource distribution amongst actors. This has an apparent effect on the actor's dependence and power relation.

How power relations and resource dependency are responsible for the creation of ambiguities

Though the latest water policy covers several key water issues very well, some critical issues, including actors power practice in terms of resource exchange and actor interdependency, were inadequate or occasionally missing due to inconsistency of rules and regulations (Chan et al., 2016). The nature of the actors involved' resource distribution is just as essential as the absence of some vital actors behind the flawed policy development process (WARPO, 2015). Funding and knowledge are considered crucial resource to the policy network. Actors power in the policy network depends on their ability to provide. Although there is a continuous interdependence in the policy network, the power practice of actors with unequal assets creates more interdependency amongst actors within the water policy network, which has far-reaching effects on policy implementation (Gain et al., 2017a).

It is clear that the actor's resource providing ability and interdependency are interrelated (Marsh, 1998). During the policy development process, a few powerful actors set the rules and regulation they need to have future benefits (Marsh and Smith, 2000). This leads to increased power imbalance and the actor's interdependence within the policy network, undermining network stability (Medema et al., 2008; WARPO 14, interview).

It is possible to reduce conflicts in the policy development process due to the absence of few crucial actors by including them from the beginning (Marsh and Rhodes, 1992b). In particular, all the actors who worked in the water sector were currently working in water

policy implementation. The exclusion of some important actors like LGED, BADC, BAE, IWM, CEGIS, international donors from the water development process resulted in various irregularities in resources distribution and actor's power practice (World Bank, 2017). The absence of local NGOs and women representatives is also significant in this regard. There is a correlation between the actor's power and resources, providing ability in the policy network (Marsh and Smith, 2000). Ensuring the inclusion of some equivalent institutions in terms of resource availability in the policy development process will balance the power practice of the network (WARPO 13, interview). The inclusion of international donor agencies like the United Nations Children's Fund (UNICEF), United Nations Development Programme (UNDP), World Bank, Japan International Cooperation Agency (JICA) could play an important role (CEGIS 1, interview).

One of the water policy objectives is to take the country's overall development forward by improving the water sector. Most of the peoples in Bangladesh live in villages, and their main economic activities are agriculture, with which water resources are directly connected (BBS, 2018). Therefore, the policy development process should have added some clauses that could benefit marginal people, particularly women and their respective families, through their implementation (Rahman et al., 2017). Regrettably, the local NGOs, working to improve women's quality of life, have not been included in this policy formulating process which is the sources of irregularities of the policy process (CEGIS 1 and WARPO 5, interview). The situation is similar for NGOs representatives in the water policy development process (BARCIK 1 and CEGIS 2, interview).

Improvement of existing water policy for increasing policy implementation effectiveness

This section discusses how to reduce the existing contradictions in water policy and make it project implementation friendly. Here is the first attempt to see how to minimise the inconsistencies regarding the inclusion of actors. An attempt is then made to understand how the contradiction related to the policy's rules and regulations can be undervalued. This is followed by an effort to reduce the actor's resource dependence and power practice inconsistencies. In water policy improvement, network management's role in working with these options is finally discussed in this section.

Although a water policy has been developed in the flawed process, there is ample opportunity to improve it (Marsh, 1998). Reducing the existing contradictions related to actors' inclusion will increase any water project's effectiveness, like the WMIP project. The inclusion of actors capable of providing adequate resources would have balanced the development process's institutional arrangement, making the project implementation more successful, similar to what Rahman et al. (2017) found. To make the water policy more realistic, the actors involved' institutional arrangement had to be fair, which could be ensured by including several important actors like DoA, BADC, DPHE and WASA etc. (WARPO 10 and BWDB 7, interview). However, the integration of maximum water actor's in the policy development process was time-consuming and costly. Instead, it is better to improve the policy based on the project outcomes. Adjusting some of the rules and regulations regarding the actor's involvement and activities in terms of realities would reduce existing contradictions. Taking the views of left-out groups in the review process will make the policies much more realistic and increase project implementation

success (BARCIK 1 and CEGIS 1, interview). Indigenous knowledge-rich women and NGOs should be considered very seriously in is this adjustment (BARSIC 1 and CEGIS 2, interview).

One way to improve the water policy is to reduce existing inconsistencies in the policy's rules and regulations. A policy can be enhanced by combining the current project outcomes with the views of the actors who were left out (Marsh and Rhodes, 1992b). In this case, the provisions of the rules relating to actors' mandate and responsibility that create policy impediments should be considered a priority. It is essential to review the existing rules and regulations to ensure maximum inclusion of actors involved in the water sector from the policy formulation to the implementation. (BWDB 6, interview). In this case, institutional mandate and responsibility have to be cleared. Inclusion of international donors' agencies (UNICEF, UNDP, World Bank and JICA), academics, local NGOs and community (agriculturist, women) could help to ensure institutional balance through sharing their knowledge and experience with WARPO and BWDB (WARPO 12 and CEGIS 1, interview). Their expertise could have secured the institutional compensation by providing implementable rules and regulations (Chan et al., 2016). Some water organisations are skilled in specific particular tasks and are mandated by the government to do so. Therefore, considering which organisations can play an essential role in fulfilling the project's objectives, it is better to include these organisations in the project's development process phase. This will improve the balance between the institutions involved in the project, which will increase the effectiveness of any project implementation.

Reducing resource distribution contradictions and controlling actor's interdependency will create opportunities for improving water policy. Another way to improve water policy could be to minimise resource distribution and supply-related inconsistencies. There is a correlation between the actor's power and resources, providing ability in the policy network (Marsh and Smith, 2000). If some institutions equivalent to resource availability are involved in the policymaking process, this would have created a balance in power practice that would have allowed the rules and regulations to unilaterally protect the central actor's interests (Marsh, 1998). If the project development process had included a few other water organisations with WARPO and BWDB, the resources getting opportunity would have increased, and the reliance on the MoWR would have decreased. Inclusion of international donor agencies like UNICEF, UNDP, World Bank, JICA was included; they could have made the whole effort much more effective with their financial and technical support. To increase awareness, they could play a role in incorporating some sections in rules and regulations. Public, private, academics, NGOs and women representatives could be more involved in the policy process (CEGIS 1, interview). The policy development process could have added some clauses favouring victims that could benefit marginal people, particularly women and their respective families, through policy follows project implementation (Rahman et al., 2017). To make the water policy more practical, some guidelines regarding the intervening of local NGOs can be added to its rules and regulations.

The Network Management Approach (NMA) can play an essential role in streamlining the above options in water policy improvement. Improvement of the water sector in Bangladesh depends on various water projects' effectiveness as part of IWRM

implementation. Since these water projects are executed following the water policy, reducing the existing contradictions in the policy can ensure the enabling environment required for project implementation. Document analysis and interviews show how disagreements have arisen and how the WMIP project has been affected as a result. Some opinions have been found from the discussions that can be implemented in an organised way within the network management to reduce these contradictions. It can offer some measures and strategies for lowering constraining conditions and ensuring enabling environment (Klijn, 2009; Klijn et al., 1995). Network management can provide an actual effort for reducing existing contradictions of the water policy. This could be done by ensuring the inclusion of crucial actors who always work in the water sector. This approach can work by enhancing the cooperation of actors included in the policy. In general, this approach can play an essential role in ensuring the enabling environment required to increase the implementation effectiveness of water projects created following water policy.

Network management approaches can improve water policy in two ways; network constitution approach and process management (Klijn and Koppenjan, 2000). The process management approach can guide how to make the interactions and cooperation of actors involved in water policy better and more comfortable. Since the actor's problem is an obstacle to the improvement of water policy, this approach addresses their problems. It emphasises their collective opinions and perceptions, which can improve the existing water policy. In addition, the approach can provide some ways to solve the problems of cooperation and interaction of autonomous organisations working in water policy in an excellent course (Klijn, 2009; Koppenjan and Klijn, 2004).

On the other hand, the network constitution approach can point out ways to increase the cooperation and interaction of the actors involved by adjusting the institutional features (Klijn and Koppenjan, 2000; Klijn et al., 1995). This could be to ensure a balance of power by enhancing the relationship between the actors in the policy by including essential actors. This approach can make policy improvement by adjusting the existing rules and regulations of the water policy. Also, the method can help the government in reframing the perception of current problems in water policy. The following steps can be considered for water policy improvement in Bangladesh under the Network Management Approach:

The inclusion of some important water actors working in the water sector in the overall activities of water policy can play a dramatic role in improving current water policy through their skills, knowledge and resource policy. Actors related to the Ministry of Agriculture (MoA) and the Ministry of Environment and Forest (MoEF) may be included in the water policy. The inclusion of the Department of Agricultural Extension (DoA) and Bangladesh Agricultural Development Corporation (BADC) can be a vital step in this regard as they are directly involved in the agriculture and water sector. The actors related to the Shipping and Garment industry also can be incorporated in the water policy because these are somehow involved with the water sector of Bangladesh. The involvement of international donors can play an essential role in improving water policy as they can enrich water policy with funds and technical support. Although a small number of national NGOs are currently working on water policy, it is essential to increase their numbers. As well as local NGOs and community groups being involved

here, they can contribute to the emergency water crisis (e.g., cyclone, flood, riverbank erosion etc.) with their indigenous knowledge.

After ensuring the inclusion of the required actors, the Ministry of Water Resources (MoWR) can be assigned as the network manager. As the network manager, the MoWR will be to put water sector development at the forefront of Bangladesh's development agenda. To resolve the existing contradictions in the water policy, the network manager may receive the perception of the concerned actors and distribute the issues among them. The network manager can encourage NGOs (international, national and local) and the private sector to be involved in water policy. To facilitate the inclusion of these actors, the policy rules and regulations need to be adjusted and made accessible so that they can be included easily.

A temporary organisational arrangement of the actors involved in the water policy will increase the cooperation and interactions among themselves, which will help the water policy. Moreover, even if a local-level office can be established, it will be helpful for policy improvement. WARPO can be given the responsibility for this work; however, BWDB may be involved in this. A large number of water projects need to be implemented to increase skills and awareness of water issues. This will provide an opportunity to get guidance on water policy improvement from the project outcome.

Policy review is very important for improving water policy, and the above steps can be performed under policy review. To review the policy correctly, some issues need to be considered seriously. The actors included in the water policy need to clear the institutional specifications. In particular, there should be a precise specification about the responsibility and mandate of WARPO and BWDB. All critical issues that have been left out of the policy content need to be re-incorporated. A specific clause should be added in the water policy regarding the financial mechanism and professional staffing of WARPO because it is an apex water body in Bangladesh. Adding provisions to the water policy to increase the use of indigenous knowledge in water resource management will make it easier for local NGOs and community groups to contribute, which will significantly help improve water policy in Bangladesh.

Conclusion

The water policy development process has been hampered due to the absence of some important water actors. The less cooperation of included actors is also responsible for making this process flawed. MoWR is the only key actor in this process, and there is no other waterbody equal to it. The sole authority of the MoWR is seen in the policymaking decision. This has led to the conclusion of the MoWR to make policy. As a result, other actors like WARPO and BWDB become more dependent on the MoWR, which is not a good sign of the policy. The local community and NGOs have not expressed their views on the 'top-down' policy development, which has affected the rules and regulations. The local community is rich in indigenous knowledge, and local NGOs work on the local community's life and livelihood.

Moreover, any policy's effectiveness is justified by how much the local community has benefited from that policy. Due to the absence of local community and NGOs, the policy formulation process has been deprived of indigenous knowledge and their experience,

which could have further enriched the policy. All of these factors have led to massive contradictions in water policy that have hampered IWRM implementation.

Since water policy already established, and numerous water projects are being carried out supporting it. So, some contradictory clauses of rules and regulations can be modified under policy review for increasing the effectiveness of the current water policy. To ensure effective IWRM implementation, the existing water policy needs to be reviewed with institutional specifications. This is because any water project's design and development process is usually carried out following the water policy. Various environmental, developmental and administrative challenges, including socio-political settings, internal problems and conflicts, need to be considered in the review for getting better outcomes of a water project. There is ample scope to take these steps under the network management approach. In this case, if the recommendations obtained from the interview are implemented according to the network management approach, the existing contradictions will be reduced, and the effectiveness of future water projects favouring IWRM will be increased.

References

- ALAM, M. M. 2014. An Evaluation of Water Resources Planning Organization, an Apex Planning Organization in Water Sector Bangladesh. *Asian Journal Of Applied Science And Engineering*, 3, 66-83.
- ALAM, M. M. & QUEVAUVILLER, P. 2014. An Evaluation of Integrated Water Resources Management (IWRM) Activities in Bangladesh. *Asia Pacific Journal of Energy and Environment*, 1, 22-38.
- ALBERT, X. 2001. *Integrated water resources management in a water abundance-scarcity cycle regime, a case study of Bangladesh*. Thesis No. WM-00-11, Asian Institute of Technology, Thailand.
- ARTS, B. & VAN TATENHOVE, J. 2006. Political modernisation. *Institutional dynamics in environmental governance*. Springer.
- BALL, S. J. 2012. *Global education inc: New policy networks and the neo-liberal imaginary*, routledge.
- BALL, S. J. & JUNEMANN, C. 2012. *Networks, new governance and education*, Policy Press.
- BANDARAGODA, D. J. & BABEL, M. S. 2010. Institutional development for IWRM: An international perspective. *International Journal of River Basin Management*, 8, 215-224.
- BBS 2018. Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistics, Dhaka, Bangladesh.
- BENSON, D., GAIN, A. K. & ROUILLARD, J. J. 2015. Water governance in a comparative perspective: From IWRM to a 'nexus' approach? *Water Alternatives*, 8, 756-773.
- BENSON, J. K. 1982. A framework for policy analysis. *Interorganizational coordination*, 137-176.
- BIDS 2014. Evaluation Study of Second Small-Scale Water Resources Development Sector Project; Bangladesh Institute of Development Studies: Dhaka, Bangladesh.
- BISWAS, A. K. 2008a. Current directions: Integrated water resources management - a second look. *Water International*, 33, 274-278.
- BISWAS, A. K. 2008b. Integrated water resources management: Is it working? *International Journal of Water Resources Development*, 24, 5-22.

- BISWAS, A. K. & TORTAJADA, C. 2010. Future water governance: Problems and perspectives. *International Journal of Water Resources Development*, 26, 129-139.
- BISWAS, A. K., VARIS, O. & TORTAJADA, C. 2005. *Integrated water resources management in South and South-East Asia*, Oxford University Press.
- BÖRZEL, T. A. 1998. Organising Babylon-On the different conceptions of policy networks. *Public administration*, 76, 253-273.
- BWDB 2016. "Bangladesh Water Development Board - Banglapedia", en.banglapedia.org. Retrieved 11 October 2016.
- CHADWICK, M. & DATTA, A. 2003. Water Resource Management in Bangladesh. *Policy Review Paper*, 1.
- CHAN, N. W., ROY, R. & CHAFFIN, B. C. 2016. Water governance in bangladesh: An evaluation of institutional and political context. *Water*, 8, 403.
- CHOWDHURY, N. T. 2010. Water management in Bangladesh: An analytical review. *Water Policy*, 12, 32-51.
- COOK, B. R. 2010. Flood knowledge and management in Bangladesh: increasing diversity, complexity and uncertainty. *Geography Compass*, 4, 750-767.
- CSIRO, W., BWDB, IWM, BIDS, CEGIS, 2014. Bangladesh Integrated Water Resources Assessment: final report, CSIRO, Australia.
- DAS GUPTA, A., BABEL, M. S., ALBERT, X. & MARK, O. 2005. Water sector of Bangladesh in the context of integrated water resources management: A review. *International Journal of Water Resources Development*, 21, 385-398.
- DEBNATH, R. 2016. A review of the sustainability of recent watershed management programmes in Bangladesh. *Lakes and Reservoirs: Research and Management*, 21, 152-161.
- DEWAN, C., MUKHERJI, A. & BUISSON, M. C. 2015. Evolution of water management in coastal Bangladesh: from temporary earthen embankments to depoliticised community-managed polders. *Water International*, 40, 401-416.
- FISCHER, F. & MILLER, G. J. 2006. *Handbook of public policy analysis: theory, politics, and methods*, crc Press.
- FOSTER, S. & AIT-KADI, M. 2012. Integrated Water Resources Management (IWRM): how does groundwater fit in? *Hydrogeology Journal*, 20, 415-418.
- GAIN, A. K., MOJTAHED, V., BISCARO, C., BALBI, S. & GIUPPONI, C. 2015. An integrated approach of flood risk assessment in the eastern part of Dhaka City. *Natural Hazards*, 79, 1499-1530.
- GAIN, A. K., MONDAL, M. S. & RAHMAN, R. 2017a. From Flood Control to Water Management: A Journey of Bangladesh towards Integrated Water Resources Management. *Water*, 9, 55.
- GAIN, A. K., MONDAL, M. S. & RAHMAN, R. 2017b. From flood control to water management: A journey of Bangladesh towards integrated water resources management. *Water (Switzerland)*, 9.
- GAIN, A. K., ROUILLARD, J. J. & BENSON, D. 2013. Can integrated water resources management increase adaptive capacity to climate change adaptation? A critical review. *Journal of Water Resource and Protection*, 5, 11.
- GOB 2013. Bangladesh Water Act 2013; Government of Bangladesh: Dhaka, Bangladesh.
- GWP 2000. Integrated Water Resources Management. TAC Background Paper No. 4. Global Water Partnership: Stockholm, Sweden.

- HOSSAIN, N. & BAHAUDDIN, K. M. 2013. Integrated water resource management for mega city: a case study of Dhaka city, Bangladesh. *Journal of Water and Land Development*, 19, 39-45.
- HU, X., YING, T., LOVELOCK, B. & MAGER, S. 2019. Sustainable water demand management in the hotel sector: a policy network analysis of Singapore. *Journal of Sustainable Tourism*, 27, 1686-1707.
- KIKERT, W., KLIJN, E.-H. & KOPPENJAN, J. F. 1997. Managing complex networks: Strategies for the Public Sector. London: Sage.
- KLIJN, E.-H. 2005. Networks and inter-organisational management. *The Oxford handbook of public management*.
- KLIJN, E.-H. & KOPPENJAN, J. 1999. *Network Management and Decision Making in Networks: A Multi-actor Approach to Governance: Network Management Strategies as Solutions for Governance Problems in Complex Decision Making*, Netherlands Institute of Government.
- KLIJN, E.-H. & KOPPENJAN, J. F. 2000. Public management and policy networks: foundations of a network approach to governance. *Public Management an International Journal of Research and Theory*, 2, 135-158.
- KLIJN, E. H. 2009. Policy and Implementation Networks: Managing Complex Interactions. *The Oxford Handbook of Inter-Organizational Relations*.
- KLIJN, E. H., KOPPENJAN, J. & TERMEER, K. 1995. Managing networks in the public sector: a theoretical study of management strategies in policy networks. *Public administration*, 73, 437-454.
- KOPPENJAN, J. F. M. & KLIJN, E.-H. 2004. *Managing uncertainties in networks: a network approach to problem solving and decision making*, Psychology Press.
- LEROY, P. & ARTS, B. 2006. Institutional dynamics in environmental governance. *Institutional dynamics in environmental governance*. Springer.
- MARSH, D. 1998. The development of the policy network approach. *Comparing policy networks*, 3-17.
- MARSH, D. & RHODES, R. 1992a. Policy communities and issue networks: Beyond typology. In: MARSH, D. & RHODES, R. A. W. (eds.) *Policy Networks in British Government*. Oxford University Press.
- MARSH, D. & RHODES, R. A. W. 1992b. *Policy networks in British government*, Clarendon Press.
- MARSH, D. & SMITH, M. 2000. Understanding policy networks: towards a dialectical approach. *Political studies*, 48, 4-21.
- MARSH, D. & SMITH, M. J. 2001. There is more than one way to do political science: on different ways to study policy networks. *Political studies*, 49, 528-541.
- MEDEMA, W., MCINTOSH, B. & JEFFREY, P. 2008. From premise to practice: a critical assessment of integrated water resources management and adaptive management approaches in the water sector. *Ecology and Society*, 13.
- MEGDAL, S. B., EDEN, S. & SHAMIR, E. 2017. Water governance, stakeholder engagement, and sustainable water resources management. *Water (Switzerland)*, 9.
- MOEF 2012. Bangladesh Rio + 20: National Report on Sustainable Development, Ministry of Environment and Forests, Peoples' Republic of Bangladesh, Dhaka, Bangladesh.
- MOP 2010. Outline Perspective Plan of Bangladesh 2010–2020: Making Vision 2021 a Reality; Ministry of Planning: Dhaka, Bangladesh.

- MOWR 2013. Bangladesh Water Act, Ministry of Water Resources, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- MULLER, M. 2010. Fit for purpose: Taking integrated water resource management back to basics. *Irrigation and Drainage Systems*, 24, 161-175.
- RAHAMAN, M. M. & VARIS, O. 2005. Integrated water resources management: evolution, prospects and future challenges. *Sustainability: Science, Practice, & Policy*, 1, 15-21.
- RAHAMAN, M. M. & VARIS, O. 2009. Integrated water management of the Brahmaputra basin: Perspectives and hope for regional development. *Natural Resources Forum*, 33, 60-75.
- RAHMAN, A. T. M. S., JAHAN, C. S., MAZUMDER, Q. H., KAMRUZZAMAN, M. & HOSONO, T. 2017. Drought analysis and its implication in sustainable water resource management in Barind area, Bangladesh. *Journal of the Geological Society of India*, 89, 47-56.
- RASHEED, K. B. S. 2011. *Water Resources Management: with example from Bangladesh*, A H Development Publishing House, Dhaka 1205.
- RHODES, R. A. 1990. Policy networks: a British perspective. *Journal of theoretical politics*, 2, 293-317.
- RHODES, R. A. 1997. *Understanding governance: Policy networks, governance, reflexivity and accountability*, Open university press.
- RHODES, R. A. 2006. Policy network analysis. *The Oxford handbook of public policy*, 425-447.
- RHODES, R. A. & MARSH, D. 1992. New directions in the study of policy networks. *European journal of political research*, 21, 181-205.
- RHODES, R. A. W. 1986. *Power dependence, policy communities and inter-governmental networks*, Department of Government, University of Essex.
- ROUILLARD, J. J., BENSON, D. & GAIN, A. K. 2014. Evaluating IWRM implementation success: are water policies in Bangladesh enhancing adaptive capacity to climate change impacts? *International Journal of Water Resources Development*, 30, 515-527.
- TEJADA-GUIBERT, J. A., SETEGN, S. G. & STOA, R. B. 2015. Sustainable development and integrated water resources management. *Sustainability of Integrated Water Resources Management: Water Governance, Climate and Ecohydrology*.
- VAN TATENHOVE, J., ARTS, B. & LEROY, P. 2000. Political modernisation. *Political Modernisation and the Environment*. Springer.
- WAARDEN, F. 1992. Dimensions and types of policy networks. *European journal of political research*, 21, 29-52.
- WARPO 2001. National Water Management Plan: Volume 1-Summary; Water Resources Planning Organisation, Ministry of Water Resources, Dhaka, Bangladesh.
- WARPO 2015. Integrated Water Resources Management, Water Resources Planning Organization, Ministry of Water Resources, Dhaka, Bangladesh.
- WORLD BANK 2017. Water Management Improvement Project (WMIP), Bangladesh, Implementation Completion and Result Report (IDA-43590 TF-94800), Report No. ICR00003136, Document of the World Bank.

Planning Standards for Playground Facilities in Urban Areas: National and International Perspectives

Adil Mohammed Khan *

Abstract: Playground is considered as a significant element of city planning, therefore play facility planning demands special attention while designing of cities and neighborhoods. Playgrounds are of varied types namely playlot, playground and playfield – depending on different age group of users. This paper primarily focuses on play facility standards followed in various cities and countries in the world as well as play facility standards and provisions in various plans and projects in Bangladesh. This paper is based on secondary sources and desk research on the readily available data was conducted for a better understanding of the planning standards for playground across global cities. ‘Time saver standard for site planning’ suggests 1 acre size for a playlot having a standard of 0.25 – 0.5 acre per thousand population and recommends 3 acres for a playground within half mile from residence having a standard of 1.5 acre per thousand population. Detail Area Plan (2010) for Dhaka city suggests 2–3 playgrounds of 1 acre size each for a Neighborhood of 12,500 people. Playgrounds that are accessible for common people are quite few in numbers in major urban areas of the country. Based on the findings of this study, this paper recommends play facility standards for playlot, playground and playfield facilities for urban areas based on planning contexts of Bangladesh.

Keywords: Planning Standard, Recreation, Playlot, Playground, Playfield

1. Introduction

Playground is considered as a significant element of city planning for building sustainable cities and communities. Playground is an important element of neighborhood planning around which community and neighborhood flourishes, therefore play facility planning demands special attention while designing of cities and neighborhoods. Planning standard for community and recreational facilities generally differs for various countries according to their specific planning environment and therefore standards of any country cannot be imitated to other country without detail assessment of demand of that individual area or cross-sections of people for whom it is going to be implied. Recreational facilities includes various types of facilities, but the major types of recreational facilities that are deemed important in preparation of physical plans for urban areas mainly include open space, park, play field, playground, playlot. Playgrounds are of varied types namely playlot, playground and playfield – depending on the different age groups and planning standard for different types of playgrounds differs in various cities and countries. Identification of proper standards for play facilities are at all times poses perplexing for urban planners and policy makers because of the scarcity of lands and their relatively greater values in city areas. As a result, setting appropriate planning standards for playgrounds are quite important for providing proper recreational facilities to ensure vibrant urban life. In addition, Bangladesh, being a developing country, faces the challenges of providing proper recreational amenities like play facilities adequately and with appropriate quality to its urban dwellers as well.

* Associate Professor, Department of Urban and Regional Planning, Jahangirnagar University, Email: adilmkhan@gmail.com; adilmkhan@yahoo.com

Different cities and countries have adopted various standards for planning and designing their playgrounds considering their own contexts. National Recreation Association (NRA) Standard of USA proposes a playlot of 220 – 460 sq-m for a population of 300 – 800 for a service radius of 1/8 mile (i.e., 200 m) or for a residential block. ‘Time saver standard for site planning’ suggests 1 acre size for a playlot having a standard of 0.25 – 0.5 acre per thousand population for a playlot and recommends 3 acres for a playground within half mile from residence having a standard of 1.5 acre per thousand population. On the other hand, Detail Area Plan (2010) for Dhaka city suggests 2–3 playgrounds of 1 acre size each for a Neighborhood of 12,500 people whereas Sylhet Master Plan proposed a standard of 2 acres of playfield for every 25,000 population which is quite similar to the standard of ‘Land Development Rules of Private Housing Project-2004’ for Dhaka city. It is widely accepted that searching for a universal standard particularly for recreational facilities is not a right choice for urban planners while designing their particular cities. However, proper understanding of playground standards followed in various cities and countries around the world is quite important for development of planning standards for playground in Bangladesh. This paper primarily focuses on playground standards followed in various cities and countries in the world as well as playground standards adopted in various plans and projects in Bangladesh. Based on the findings of this study, this paper also recommends playground standards for urban areas in planning contexts of Bangladesh.

2. Methodology of the Study

This paper is primarily based on secondary sources and desk research on the readily available data was conducted for a better understanding of the planning standards for playgrounds across various cities and countries around the world. ‘Time Saver Standard for Site Planning’ has also been analyzed for planning standards of different types of play facilities. Planning standards and provisions regarding play and sport facilities practiced for urban planning for various cities in Bangladesh in respective master plans, structure plans or any other relevant plans have also been explored.

In order to get an overall picture of planning standards and provisions of playground facilities in urban areas of Bangladesh, various categories of urban areas have been selected for this study to represent each category of urban areas. Moreover, study areas are purposively¹ selected across various regions of Bangladesh for proper representation of various types of urban areas in Bangladesh.

Six major Metropolitan Cities of Bangladesh have been selected as well as four ‘A’ Category, Three ‘B’ Category and Three ‘C’ Category Paurashavas have been selected for analysis of playground provisions at different categories of urban areas in Bangladesh.

¹ Paurashavas that have prepared master plans for their respective municipalities have been considered for this study.

Table 1: Urban Areas Selected for the Study

| Metropolitan City | Paurashava / Municipality | | |
|-------------------|---------------------------|------------------------|----------------------|
| | A Category | B Category | C Category |
| Dhaka, Chittagong | Savar (Dhaka) | Daudkandi (Comilla) | Nageswari(Kurigram) |
| Rajshahi, Khulna | Jhenaidah, Gopalganj | Bajitpur (Kishoreganj) | Kasba (Brahmanbaria) |
| Barishal, Sylhet | Bhairab (Kishoreganj) | Pirganj (Thakurgaon) | Melandaha (Jamalpur) |

Based on the findings regarding playground standard and provisions from international and national practices, planning standards have been suggested for various categories of playgrounds for urban areas in Bangladesh.

3. Planning Standards for Playground and Recreation Facilities: Review of Concepts

Play is defined as a chosen activity that engages the child quite enthusiastically. Play provision hence includes a range of activities and support which requires spaces and facilities to pursue play. This comprises both formal and informal play provision (City of London, 2009).

The planning standard is used to define the minimum area for each use for a certain population or for a definite area. These minimum standards are formulated for a specific area by studying the functional requirements, number of users and other similar parameters (LGED, 2010). The main purpose of recommending planning standards for urban planning is to provide a base for taking planning decisions. The recommended rules and standards are suggestive and can be appropriately adapted depending upon the local circumstances (Rao, 2001).

While re-planning of British cities generally followed a rule to provide 7 acres of public open space per 1,000 persons and this standard is considered applicable where no other standard has been established (Veal, 2008). It is commonly acknowledged that the provision of open space ranges from *10 to 28 square metres per person* (Daley, 2000). In the United States, the National Recreation Association recommended 10 acres per 1,000 persons for neighborhood park and recreation areas and minimum of 5 acres per 1,000 persons, or at least 10 per cent of the neighbourhood area (Brown and Sherrard, 1951).

New South Wales city of Australia followed a general standard that divides the 2.83 hectares into 1.21 hectares for 'active' open space like sports fields and 1.6 hectares for 'passive' open space used for for informal recreation). "Playground Association of America" suggested playground space equal to 30 square feet per child in 1906.

Play facilities are considered important and indispensable community facilities to ensure recreational purposes of urban dwellers. Play facilities are generally divided into three types for different age range of population – namely Playlot, Playground and Playfield (Mcgraw-Hill, 1999).

The standard for playlot, playground, playfield and park generally differs across different cities and countries due to the differences in the socio-economic and planning context. Therefore planning standard for recreational facilities for urban areas should be articulated based on cautious examination of planning context.

Each residential area requires a wide range of recreational facilities to ensure proper dwelling environment for people in the locality. Play lot, playground and playfields are recreational facilities that must be designed by the planners to ensure recreational facilities for the community. Gallion and Eisner (1986) suggested following standards for playground of a residential area according to the size of the population, as shown in Table 2.

Table 2: Standards for playground for a residential area according to population

| Population | Number of Children | Size in Acres |
|------------|--------------------|---------------|
| 2000 | 450 | 3.25 |
| 3000 | 600 | 4.0 |
| 4000 | 800 | 5.0 |
| 5000 | 1000 | 6.0 |

Source: Gallion and Eisner, 1986

Playlots are small areas designed for children of pre-school age. According to different international standards, a playground for fewer than 200 children is unviable to function properly whereas more than 1200 children require two or separate playgrounds. The playground should provide an adequate area for informal play. There should be courts for various sports such as soccer, volleyball, badminton, cricket etc. For every thousand population, 0.25-0.5 acre for Playlot, 1.5 acre for playground and 1.5 acre should be dedicated for playfield facility as recommended in 'Time Saver Standard for Site Planning' (Mcgraw-Hill, 1999).

Table 3: Planning Standards for Playlot, Playground, Playfield and Park at USA

| 1 | USA Standard (Acre Per 1000) | Recommended size in USA | Maximum distance served /Service Radius | Age Group |
|------------|------------------------------|-------------------------|---|----------------------------------|
| Play lot | 0.25-0.5 | 1 | 1/8 mile | Pre School |
| Playground | 1.5 | 3 | 1/2 mile | School going (6- 15) |
| Playfield | 1.5 | 15 | 1 mile walking or 1/2 mile riding | Young and Adults (15+ Age Group) |
| Park | 1.25 | 20 | 1 mile | All age groups |

Source: Khan 2012; Mcgraw-Hill, 1999; APA 1965

National Playing Fields Association (NPFA), founded in 1925, developed the 'British standard' for recreational facilities, with an aim to ensure that every man, woman and child in Great Britain and Northern Ireland would have the chance to participate in outdoor recreational activity within appropriate distance of home during their free hours. The Association suggested every local authorities to implement a minimum standard of provision of 5 acres of public open space for every 1000 people, of which at least 4 acres should be dedicated for team games, tennis and bowls. After inclusion of private playing space and school playing fields in 1934, this standard was increased to 7 acres. In 1938 the 1 acre of open space, initially included for parks and public gardens, was excluded to make the standard of 6 acres for play space only.

In the late 1960s, British Ministry of Housing and Local Government (MHLG) found that play provision of playing fields above 1.5 acres (0.6 ha.) per 1000 population did not produce increased levels of participation. However a demand-based procedure for calculating requirements for playing fields have been suggested by Sports Council of UK by using available participation data and proposed 2.4 acres of playing fields per 1000 population (City of Oxford, 2008).

Different sizes of playground and playfields are available in urban areas of Bangladesh which are under ownership of various organizations and institutions and most of them are not generally open to common people. Only few playgrounds are owned by city corporations, development authorities or municipalities – thereby accessible to common people. Play facility standards were not given proper importance in Master Plans of various cities in Bangladesh in the past.

4. Planning Standards for Playlot, Playground, Playfield and Park: Global Perspectives

There are different set of standards for various types of play facilities – such as playlot, playground and playfield – for different age groups of a community. Following section describes planning standard for different types of playgrounds that are being practiced by various cities and countries across the world regarding planning standards for play facilities.

4.1 Playlot Facility Standards

Playlots are small areas generally designed for children of pre-school age. Playlot or ‘Tot lot for smaller children’ (i.e. toddlers) should be located on smaller area than the playground and nearer to dwelling units for easy supervisions. Several play lot can be developed within any particular development. It is a common practice to include a playlot area as part of a neighborhood playground. Playlot facilities should be simple and safe and include the following: swings (low, regular), slides (low), sand box, mountain climber (low), play sculptures, one or more play houses, open area for free play, a shelter with benches for mothers, space for baby carriages, small wading pool or spray pool, concrete walk and paved area for wheeled toys, and with a low fence around the entire area.

National Recreation Association (NRA) Standard of USA proposes a playlot of 220 – 460 sq-m for a population of 300 – 800 for a service radius of 1/8 mile (i.e., 200 m) or for a residential block. NRA proposes for 50 to 60 sq. ft play space for a child. ‘Time saver standard for site planning’ suggests 1 acre size for a playlot and a standard of 0.25 – 0.5 acre per thousand population for a playlot, which is also supported by Chiara and Lee Koppelman (1975) in "Urban Design and Planning Criteria". American Public Health Association recommends playlot of 150 – 500 sq-m (desired size 350 sq-m) for pre-school children for 75 children or less within 300 to 400 ft of every house and play-space standard of 40 – 50 sq-ft per child.

Table 4: Playlot Facility Standard in Foreign Countries

| City/ Country | Category/Type/Source (as appropriate) | Population Coverage | Area in Acres | Other Standards/Radius |
|---|---|-----------------------------------|--|--|
| USA | National Recreation Association Standard, 1954 (for Active Recreation) | 300 to 800 | 2,400 to 5,000 sq. ft. (220 – 460 m ²) (50 to 60 sq. ft./Child) | 1 block or 1/8 mile |
| <i>Time saver standard for site planning (McGraw-Hill, 1999)</i> | | (0.25-0.5 acre) per 1000 | 1 | 1/8 mile |
| District of Columbia | Play and decorative areas (in Block and street space) | Capacity—60 persons | ≤0.60 acre | Service Radius 2 blocks |
| Joseph De Chiara and Lee Koppelman (1975) in "Urban Design and Planning Criteria" | | | | |
| | Children's Play Area (with Equipment) | 0.5 acre/1000 pop. | 1 acre | Playgrounds, Neighborhood Parks, Community Parks, School Playgrounds |
| Hong Kong | Children's Playground | 5000 | 400m ² | |
| Bhutan | Children's Playground | 1 per 2500-4000 | 100 sq-m (min) | 10 minutes walking from most houses. |
| South Africa | Neighborhood Playlot | 800 | 0.04—0.1 ha | Radius 0.5 km |
| England (London) | Local Area for Play | | > 0.01 ha (100 sq.m) | 1 min travel (100m) |
| | Local Equipped Area for Play | | > 0.04 ha (400 sq.m) | 5 min travel (400m) |
| | Neighbourhood Equipped Area for Play | | > 0.1 ha | 1000 m (15min) |
| | Settlement Equipped Area for Play | Often included within large parks | | Over 1000 meters |
| Tanzania | Children Play ground | | 0.2-0.4 ha | Tanzania |
| Malaysia (Shah Alam City) | Playground (Children play areas) | 500 | 0.5 acre | 1 acre/1000 |

Source: Compiled by Author (Data Source: APA, 1965; Lancaster, 1990; Planning Department of Hong Kong, n. d.; Putrajaya Local Plan, 2002; Damphu Structure Plan, 2006; PPDC, 2008; Green, 2012)

Hong Kong proposes a standard of 400 sq-m for children's playground for 5 thousand population. South Africa recommends for a playlot of 0.1 – 0.25 acres with a radius of 0.5 km for a population of 800. Shah Alam city of Malaysia proposes children's play area of 0.5 acre for every 5 hundred people whereas London city of England categorized four

types of play areas for children. London city suggests Local Area for Play (without equipments) of more than 100 sq-m within 1 min travel whereas ‘Local Equipped Area for Play’ of more than 400 sq-m within 5 min travel. In addition, it also recommends ‘Neighborhood Equipped Area for Play’ of greater than 1000 sq-m within 1 km as well as ‘Settlement Equipped Area for Play’ situated more than 1 km away from residence which is often included within large parks.

4.2 Playground Facility Standards

The neighborhood playground generally serves the needs of the five to 15 year age group, but may provide limited facilities to the entire neighborhood. Playground is the primary center of outdoor play for children, with partial opportunities for recreation for youths and adults. However, a part of the playground may be designed as a playlot. Playground generally becomes a central area where the community can find recreation and mingle with family, neighbors and friends. Therefore ideally playground should centrally located for easy access of all children within the area or adjacent to other community facilities within the neighborhood area.

Local Planning Administration (LPA) of USA recommends for a playground of 3–7 acres (ideally 5 acre) for a population of 5 – 10 thousand with a service radius of 400 m for high density and 800 m for low density. It also recommends that playground should be located next to an elementary school and also be central in the neighborhood. American Public Health Association recommends for 2.75 acre per thousand population for playground, indicating 2.75 acres size for a population of 1000 to 5000. However Time saver standard for site planning recommends for 3 acres for a playground with a radius of 800 m. District of Columbia indicated a capacity of 264 persons for a ‘Neighborhood Playground’ of 3 – 5 acres with a service radius of 600 m.

“Time Saver Standard for Site Planning” suggests 3 acres for a playground within half mile from residence having a standard of 1.5 acre per thousand population. India recommends for a playground for a secondary school having an area of 4 acres whereas 0.5 acres for primary school playground. South Africa proposes a neighborhood playground of 1 – 2.5 acre with a service radius of 500 m whereas one soccer practice field is suggested for a population of 3 thousand, thereby proposing 24 soccer practice field for a population of 60 thousand (20 for neighborhood and 4 for community). For Malaysia, Kuala Lumpur city proposes 1.2 acre for a playground whereas Putrajaya city proposes 1.5 acre for the same.

Table 5: Playground Facility Standard in Foreign Countries

| City/ Country | Category/Type/Source (as appropriate) | Population Coverage | Area in Acres | Other Standards/Radius |
|---|--|---|--------------------------|--|
| USA | | | | |
| Local Planning Admin. | Playground | 3,000—5,000 | 3—7 (ideal- 5) | High density: 1/4 mile; Low density: 1/2 mile |
| | <ul style="list-style-type: none"> - All ages but mostly 5-15 years - Next to an elementary school and also be central in the neighborhood | | | |
| American Public Health Association | Playground | 1,000 to 5,000 (2.75 acre/1000) | 2.75 | |
| | Playgrounds | 1.25 acres per 1000 population | | |
| | <i>Time saver standard for site planning</i> (Mcgraw-Hill. 1999) | 1.5 Acre Per 1000 | 3 | 1/2 mile |
| District of Columbia | Neighborhood playgrounds | Capacity—264 persons | 3—5 | Radius 3/8 mile |
| Joseph De Chiara and Lee Koppelman (1975) in "Urban Design and Planning Criteria" | | | | |
| | Field Play Areas for Young Children | 1.5 acres/1000 pop. | 3 acres | Playgrounds, Neighborhood Parks, Community Parks |
| Hong Kong | Football pitch | 1 per 100 000 | | |
| | Football pitches within sports grounds do not count towards standard due to their inaccessibility to the public. | | | |
| India | Playground | Primary School | 0.5 acre | |
| | Playground | Secondary School | 1.60 ha | |
| Bhutan | Local Field Sport facility | 1 per 5,000 (0.50 ha per 1000 people) | 4—5 acre | |
| South Africa | Neighborhood Playground | 4000 | 0.4—1 ha | Radius 0.5 km |
| | Soccer practice field | 24 nos. for 60,000 (1 per 3,000) | 0.55 ha/ Facility | |
| City/ Country | Category/Type/Source (as appropriate) | Population Coverage | Area in Acres | Other Standards/Radius |
| Tanzania | Community Playground | | 4.0-8.0 ha | |
| Malaysia (Kuala Lumpur) | Local Play Area | 5000 | 1.2 acre | 0.25 acre/1000 |
| Putrajaya | Playground | 0.6 sq-m per person | 1.5 acre | |

Source: Compiled by Author (Data Source: APA, 1965; Lancaster, 1990; Planning Department of Hong Kong, n. d.; Putrajaya Local Plan, 2002; Damphu Structure Plan, 2006; PPDC, 2008; Green, 2012)

Hong Kong city proposes a ‘Football Pitch’ per one lakh population, however rightly pointed that Football pitches within sports grounds should not be counted in standard due to their inaccessibility to the common people. CSIR policies of South Africa suggests that use of playground facilities of schools by the general public in areas where there are shortages of sport and recreation facilities, may lessen shortages and improve maintenance and management issues. However, in some areas schools themselves do not have their own sporting fields and facilities and hence require access to public playfields. In addition, multi-purpose sports halls and complexes that are adjacent to, close to or are part of school properties, encourage cost and land savings.

4.3 Playfield Facility Standards

Playfield is generally targeted for young people and adults and provides a variety of recreational activities. A single playfields may function for several neighborhoods and the walking distance should not exceed one mile, suggested radius is one-half-mile. American Public Health Association (APHA) recommends a playfield of 20 – 25 acres for a population not more than 20 thousand within 15 to 24 years age and family groups. APHA proposes that playfield will be central for 3 to 5 neighborhoods preferred adjoining a school, having service radius of 1 mile or less from every home that might vary with population density in some cases, however suggests a standard of 1.25 acres per thousand population for playfield (Table 6).

Table 6: Playfield Facility Standard in Foreign Countries

| City/ Country | Category/Type/Source (as appropriate) | Population Coverage | Area in Acres | Other Standards/Radius |
|---|--|---|------------------------------------|--|
| USA | | | | |
| American Public Health Association | Playfield | Not more than 20,000 | Size: 20—25 acres | 15 to 24 years and family groups |
| | | -Central 3 to 5 neighborhoods preferred adjoining a school -Radius: 1 mile or less from every home (varies with pop. Density in some cases) | | |
| | Playfields | 1.25 acres per 1000 population | | |
| | Total active recreation | 2.5 acres per 1000 population | | |
| | <i>Time saver standard for site planning (Mcgraw-Hill, 1999)</i> | <i>(Acre Per 1000)</i> | <i>Recommended size in USA</i> | <i>Maximum distance served /Service Radius</i> |
| | Playfield | 1.5 | 15 | 1 mile walking |
| Joseph De Chiara and Lee Koppelman (1975) in "Urban Design and Planning Criteria" | | | | |
| | Older Children- Adult Field Sports Activities | 1.5 acres/1000 pop. | 15 acres | Playfield, Community Park, District Park |
| | Tennis-Outdoor Basketball Other Court Sports | 1.0 acres/1000 pop. | 2 acres | Playfield, Community Park |

Source: Compiled by Author

Chiara and Lee Koppelman (1975) in "Urban Design and Planning Criteria" suggests 15 acres for a playfield while India recommends for a playfield of 6 acres in a secondary

school. However Australia proposes for 25 acres for a District Playfield for 15 thousand population.

Table 7: Playfield Facility Standard in Foreign Countries

| Country | Category/Type/Source (as appropriate) | Population Coverage | Area in Acres | Other Standards |
|------------------------------|--|---|---|-----------------|
| India | Playfield | Higher Secondary School | 2.50 ha | |
| South Africa | Soccer practice field | 24 nos. for 60,000 (1 per 3,000) | 0.55 ha per Facility | |
| | | 20 no at Neighborhood and 4 no at Community Level (total-24 nos) | | |
| | General Provision | 0.56 ha/1000 | | |
| | | An additional 0.3 ha per 1000 in metropolitan areas for higher order facilities | | |
| | Access Distance | 3—10 km for local facility | 10—50 km for regional facility | |
| | Hierarchy of provision | Threshold Population | Area (ha)/1,000 | |
| | Neighborhood | 3,000 | 0.23 ha | |
| | Community/Sub-district | 15,000 | 0.21 ha | |
| | District/Sub-regional | 60,000 | 0.12 ha | |
| | Metro/Regional | 1,20,000 | 0.3—0.4 ha | |
| Australia | Active Recreation Space | ha/1,000 population | Includes all sporting fields (junior and senior), courts and greens available for public use. | |
| | Playfield | | | |
| | District | 15,000 | Min. 10.7 hectares | |
| | Sub-District | 5,250 | 6.1 to 10.7 hectares | |
| | Local | 3,500 | Between 2.7 to 6.1 hectares | |
| | Neighborhood | | Less than 2.7 hectares (not a desired space) | |
| Tanzania | Community Playfield | | 10.0-20.0 ha | |
| Malaysia (Shah Alam City) | Playing Field | 500 | 1 acre | 2 acre/1000 |

Source: Compiled by Author

5. Playground Standard for Urban Areas in Bangladesh

5.1 Playground Facilities in Metro City Plans

Most of the metro cities in Bangladesh have not followed any specific planning standard for playgrounds while preparing respective physical plans. Development Plans and Master Plans of metro cities like Dhaka and Chittagong proposed standard for open space per thousand population while ignored the necessity of proposing as well as following those standards in their proposed development plans (Khan, 2016). DMDP for Dhaka city

proposed playground standard as ‘Double usage of primary and secondary school yards’ for its plan while DAP for Dhaka city also ignored playground standard while detail area planning for Dhaka city.

However, as presented in Table 8, Sylhet Master Plan proposed a standard of 2 acres of playfield for every 25,000 population which is quite similar to the proposed standard of ‘Land Development Rules of Private Housing Project-2004’ for Dhaka city.

Table 8: Standard of Playground Facilities at Metro City Plans in Bangladesh

| Plans for Metro City | Standard |
|---|---|
| DMDP | Double usage of primary and secondary school yards |
| DAP for Dhaka | For a Neighborhood (12,500 people); 2 – 3 playgrounds of 1 acre size each. (0.25 acre play space per thousand.) |
| Sylhet Master Plan | 2 acres of playfield for every 25,000 |
| Private Residential Land Development Rules - 2004 (PRLDR) | <ul style="list-style-type: none"> ○ 2 acres of playfield for every 25,000 ○ (0.08 acre per 1000 population) ○ 1 acre per 10,000 |

Source: Compiled by Author

With the exception of Rangpur Master Plan, there is no evidence in the physical planning of urban areas in Bangladesh at any level regarding maintaining specific standards for various levels of playgrounds—such as playlot, playground and playfields. Necessity of play and its impact on the development of children and youth was not duly recognized in the past planning efforts in various cities in Bangladesh.

Table 9: Proposed Standard for Playground in Rangpur City Corporation

| Facility | Home to Facility Distance (Km) | | Area Required (Acre) | | Population Served | | Remarks |
|-----------------------------|--------------------------------|------|----------------------|---------|-------------------|---------|---|
| | Desired | Max. | Min | Desired | Min | Desired | |
| Playlot | | | 0.1 | 0.16 | 200 | 500 | • Right beside residence |
| Play Ground for young | 0.25 | 0.5 | 1.5 | 2.5 | 3000 | 5000 | • May not be required so frequently where adequate School field is provided |
| Play Field for adult/Eidgah | - | - | 3.25 | 5.0 | - | - | • 1 per block • Have to accommodate a standard cricket field |

Source: Rangpur Master Plan (Draft), 2014.

5.2 *Playground Facilities in Paurashava Plans*

Upazila and Paurashava Master Plans of nineties – prepared by LGED and UDD recommended for playground standard of 3 acres per 20,000 population. District Town Infrastructure Development Project (DTIDP) conducted by LGED for preparation of Master Plans for ‘A Category’ Paurashava proposed 2 acre per 25,000 Population and recommended maximum walking distance of 1.5 km (Table 10). However, Upazila Town Infrastructure Development Project (UTIDP) carried out also by LGED for preparation of Master Plans for ‘B and C Category’ Paurashava proposed 3 acre per 20,000 population.

Table 10: Standard of Playground Facilities at Municipalities in Bangladesh

| Plans for Paurashava | Types | Standard |
|---|------------------------|---|
| Paurashava Plans of Nineties by UDD (for Playground/Stadium) | | 3.00 acres/20,000 pop. |
| Paurashava Plans of Nineties by LGED (for Playground/Stadium) | | 3.00 acres/20,000 pop. |
| District Town Infrastructure Development Project (DTIDP) | Playground | 2 acre per 25,000 Population; maximum walking distance 1.5 km |
| | Stadium/sports complex | 5 acre per 50,000 Population |
| Upazila Town Infrastructure Development Project (UTIDP) | Playground | 3.00 acres/20,000 population |
| | Stadium/sports complex | 5 – 10 acres/Upazila HQ |

Source: Compiled by Author

6.0 Existing Provision of Playground Facilities at Metro Cities in Bangladesh

6.1 *Playground Facilities at Metro Cities*

Playgrounds that are accessible for common people are quite few in numbers in major urban areas of the country. Most of the playgrounds, currently available in the metro areas of Bangladesh are presently under the ownership of various institutions – mostly belongs to various educational institutions. If the case of Dhaka city is considered for instance, there were 148 playgrounds in the city area with an area of 235 acres though only 26 playgrounds are public playgrounds which are theoretically accessible for common people and owned by city corporations or public works department or other government institutions (Ahmed, 2000). However among these public playgrounds, some fields are illegally occupied by sports club or influential groups of people, thereby limiting the accessibility of common people to these grounds as well (BIP, 2018). Hence, if we consider only the numbers of playgrounds for Dhaka city, the average population coverage of a playground in Dhaka city is 44 thousand whereas it will drastically altered to 346 thousand population coverage when considering the public playgrounds only which are accessible to common people. The average size of playgrounds in Dhaka city stands at 1.6 acres.

Table 11: Provision of Playground Facilities at Metro Cities in Bangladesh

| City | Playground | Area | Thou/Fac | Acre/Thou |
|---|-------------------------------|-------------|--|------------------|
| Dhaka | 148 | 235 | 44 | 0.04 |
| Dhaka (accessible to common people) | 26 | 39 | 346 | 0.004 |
| Dhaka South City Corporation | 9 (under city corporation) | 21 | 356 | 0.007 |
| Dhaka North City Corporation | 15 (under city corporation) | | 40 (under all public and private organizations) | |
| Chittagong | 59 | 38 | 44 | 0.01 |
| Chittagong (above 0.5 acres) | 25 | | | |
| City | Playground | Area | Thou/Fac | Acre/Thou |
| Rajshahi | 13 | 20 | 35 | 0.04 |
| Khulna | 24 | 36 | 31 | 0.05 |
| Sylhet | 18 | 27 | 27 | 0.06 |
| Barishal | 16 | 24 | 21 | 0.07 |
| Total | 251 | 379 | 44 | 0.03 |

Source: Analyzed by Author; (Data Source: District Statistics of BBS, 2011; Latest Development Plan, Structure Plan, Master Plan and Detail Area Plans of the relevant Cities; RAJUK, 1995; RAJUK, 2014; RDP, 2015; RMDP, 2004; RMP (Draft), 2014; DAP, 2010.)

Among the other metro cities in Bangladesh, Chittagong city have highest number of playgrounds (59) with 44 thousand population per every playground. However, Barishal city is in better situation in terms of population coverage (21 thousand per each playground) followed by Sylhet (27) and Khulna (31), as depicted in Table 11. It is quite noteworthy that there is direct relationship between size of the city and population coverage per facility – signifying that large cities have greater inadequacy of playgrounds than the smaller metro cities in Bangladesh. As a whole, for metropolitan cities in Bangladesh 0.03 acre land is only available for playgrounds per thousand population and each playground serves 44 thousand of population on average though if we consider opportunity for common people having access into these playgrounds, these figure will be much worse in reality.

6.2 Playground Facilities at Paurashavas in Bangladesh

Playgrounds accessible for common people are quite inadequate in the Paurashava areas in Bangladesh and like the metro cities, most of the playgrounds under the ownership and supervision of various institutions, thereby barring the accessibility of common people into these grounds.

Playground Facilities in 'A' Category Paurashavas

For the case of 'A' category municipalities those are studied in this research, only 0.02 acres are available per thousand population for outdoor play facilities, as revealed in Table 12. Therefore due to the current shortage of play areas in municipalities, aggregately 18 playgrounds with an average area of 1.18 acres have been proposed for Jhenaidah, Gopalganj and Bhairob Paurashavas in respective Master Plans.

Table 12: Provision of Playground Facilities in 'A' Category Paurashavas

| Municipality | Present | | Proposed | | | Future | |
|------------------|-------------|-------------|-----------|--------------|-------------|--------|-------------|
| | Area | Acre/Thou | Number | Area | Acre/Fac | Area | Acre/Thou |
| A Cat Paurashava | | | | | | | |
| Jhenaidah | 2.28 | 0.02 | 6 | 8.9 | 1.48 | 11.18 | 0.07 |
| Gopalganj | 2.74 | 0.04 | 5 | 7.22 | 1.44 | 9.96 | 0.07 |
| Bhairob | | | 7 | 5.2 | 0.74 | | |
| Savar | 4.5 | 0.03 | | | | | |
| Total | 9.52 | 0.02 | 18 | 21.32 | 1.18 | | 0.07 |

Source: Analyzed by Author (Data from Master Plans of Respective Municipalities)

Playground Standards in 'B' Category Paurashavas

Analysis of the Master Plans of B category Paurashavas reveals that playground area of 0.09 acres is available per thousand population at present. On an average, 1.13 acres area has been proposed for a playground in the proposed Master Plans whereas 5.97 acres land has been proposed for a stadium facility in B category Paurashavas (Table 13).

Table 13: Provision of Playground Facilities in 'B' Category Paurashavas

| Name | Present | | Proposed Playground | | | Proposed Stadium | | |
|--------------|--------------|-------------|---------------------|--------------|-------------|------------------|--------------|-------------|
| | Acre | Acre/Thou | No | Acre | Acre/Fac | No | Acre | Acre/Fac |
| Paurashava | | | | | | | | |
| Daudkandi | 5.84 | 0.13 | 10 | 9.09 | 0.91 | 1 | 8.37 | 8.37 |
| Bajitpur | 0 | 0.00 | 3 | 5.54 | 1.85 | 1 | 3.57 | 3.57 |
| Pirganj | 4.28 | 0.14 | | | | | | |
| Total | 10.12 | 0.09 | 13 | 14.63 | 1.13 | 2 | 11.94 | 5.97 |

Source: Analyzed by Author (Data from Master Plans of Respective Municipalities)

Playground Standards in 'C' Category Paurashavas

Analysis of the Master Plans of C category Paurashavas reveals that Master Plan of Kasba Paurashava proposes 6 playgrounds with an area of 5.37 acres and Nageswari Paurashava proposes 9 playgrounds with an area of 12 acres which has been presented in Table 14. Therefore 1.16 acre land has been proposed in the Master Plans for each playground on average.

Table 14: Standard of Proposed Playground in Master Plan of ‘C Category Paurashava’

| Municipality | Proposed | | |
|------------------|-----------|--------------|-------------|
| | Number | Area | Acre/Fac |
| C Cat Paurashava | | | |
| Kasba | 6 | 5.37 | 0.9 |
| Melandaha | 0 | | 0 |
| Nageswari | 9 | 12 | 1.33 |
| Total | 15 | 17.37 | 1.16 |

Source: Analyzed by Author (Data from Master Plans of Respective Municipalities)

6.3 Playground Standard in Proposed Master Plan for Paurashava under DTIDP and UTIDP

Playgrounds, proposed in DTIDP and UTIDP plans have not been categorized in various types like playlot, playfield and playgrounds – therefore it can be said that play opportunities for varying age categories have not been recognized in these masters plans. It has been found from the analysis of Master Plans of studied Paurashavas from A, B and C categories, 60.2 acres area has been proposed for 46 playgrounds with an average 1.16 acres of area per playground, as shown in Table 15.

Table 15: Playground Standard in Proposed Master Plan for Paurashava under DTIDP and UTIDP

| Name | Playground – Proposed | | |
|--------------|-----------------------|--------------|-------------|
| | No | Acre | Acre/Fac |
| Paurashava | | | |
| A Category | 18 | 21.32 | 1.18 |
| B Category | 13 | 14.63 | 1.13 |
| C Category | 15 | 17.37 | 1.16 |
| Total | 46 | 53.32 | 1.16 |

Source: Analyzed by Author (Data from Master Plans of Respective Municipalities)

7. Recommended Standard for Sports and Play Facilities for Urban Areas in Bangladesh

Participation of people in play and sport activities generally increases if proper play facilities are appropriately provided within the neighborhoods. Khan and Kalam (2015) finds that 37 percent of people aged between 12 – 25 years old are willing to participate in sports at least once in a week among whom 16 percent wishes to play for more than once in a week if proper facilities are provided to them. Considering the planning standards of playgrounds, observed from global practices as well as various findings from this research, following standards for sports and play facilities are recommended for urban areas in Bangladesh.

Standard for Playlot

Six percent of population belongs to the age group 3 – 5 years in Bangladesh, therefore for a population of 5 thousand; there are 300 children available on average. As a result, if 25 percent of children (i.e. one in four) want to enjoy Playlot facility on a given day, there should be facility available for 75 children.

Hence Playlot area of 400 – 800 sq-m is recommended for high density urban areas in Bangladesh for a population of 3,000 – 5,000 for service radius of 0.3 – 0.5 km. In addition, for low density areas, 0.25 – 0.5 acres for a Playlot is recommended for 1500 – 3000 people in an urban area.

Standard for Playground

Twenty percent of population belongs to the age group of 6 – 14 years in Bangladesh, therefore for a population of 10 thousand; there are 2000 person available on average in this group. As a result, if 20 percent of this age group desires to enjoy playground facility on a given day, there should be playground facility available for 400 persons.

In this regard, 1 – 1.5 acres is recommended for a playground facility for 5 to 10 thousand people in low density urban areas for a service radius of 0.5 – 1 km or for a neighborhood. For high density urban areas, threshold population of 15 to 20 thousand is suggested for urban areas in Bangladesh.

Standard for Playfield

Twenty percent of population belongs to the age group 15 – 24 years in Bangladesh, therefore for a population of 20 thousand; there are 4000 person available on average in this group. As a result, if 20 percent of this age group wish for enjoys playfield facility on a particular day, there should be playfield facility available for 800 persons.

Hence 2–3 acres is recommended for a playfield facility for 20 to 25 thousand people in low density urban areas for a service radius of 1–1.5 km or for a community. However threshold population of 30 to 40 thousand is suggested for high density urban areas in Bangladesh.

Standard for Sports Center

Sport Center facilities should be developed in urban areas in Bangladesh for making provision for active recreational facilities which might be provided by private sectors. Standard for these facilities are not provided in various Master Plans or development plans in Bangladesh, however various countries do have the standards for this type of facilities as well as they provide recreation centers for active recreation for their urban people.

Sports centre may be developed (mainly by private sector) in high density urban areas, and land areas should be reserved for this types of facilities in the Master Plan. Young and adults can access these facilities even in the evening or at night hours, however as these facilities are developed by private sector, some sort of payments have to be made by the users for availing this facilities, therefore space of these facilities should not be included in regular space for active recreational use for people as these types of facilities are not common facilities open for all.

In this backdrop, Sport Centre facility of 1 – 2 acres is recommended for high density urban areas for 75 thousand to 1 lakh population (Table 16). For low density urban areas in Bangladesh, sports centre facility is suggested for 50 to 65 thousand population. These types of facilities will lessen the pressure on other active recreation spaces such as playfields or playgrounds and certainly help to increase the opportunity for active recreation for urban people who are otherwise unable to access recreational facilities.

Table 16: Recommend Standard for ‘Sports and Play’ Facilities in Bangladesh

| Types | Type of Urban Area | Population Threshold | User Threshold | Area | Service Radius | Age Group (User Percent) |
|--|--------------------|----------------------|---|-----------------|--------------------------|----------------------------|
| <i>Playlot</i> | Low Density | 1,500 – 3,000 | 75 children or less | 0.25 – 0.5 acre | 0.3 – 0.5 km | 3 – 5 years (6%) |
| | High Density | 3,000 – 5,000 | [5000 x 0.06 = 300; 300x 0.25 = 75] | 400 – 800 sq-m | Neighborhood | |
| Where outdoor space are not possible to provide, indoor space should be provided | | | | | | |
| <i>Playground</i> | Low Density | 5,000 – 10,000 | 400 | 1 – 1.5 | 0.5 – 1 km | 6 – 14 years (20%) |
| | High Density | 15,000 – 20,000 | [10,000 x 0.2 = 2000; 2000x0.2 =400] | 1 – 1.5 | Neighborhood | |
| <i>Playfield</i> | Low Density | 20,000 – 25,000 | 800 | 2 – 3 acre | 1 – 1.5 km | 15 – 24 years (20%) |
| | High Density | 30,000 – 40,000 | [20,000 x 0.2 = 4000; 4000 x 0.2 = 800] | 2 – 3 acre | Community | Maximizing use of facility |
| <i>Sports Centre</i> | Low Density | 50,000 – 65,000 | | 1 – 2 acre | | Private Facility |
| | High Density | 75,000 – 1 lakh; | | 1 – 2 acre | High density urban areas | Private Facility |

Source: Developed by Author

8. Concluding Remarks

Most of the metro cities in Bangladesh have not followed any specific standard for planning for playgrounds while preparing their respective physical plans. Development Plan and Master Plan of metro cities like Dhaka and Chittagong proposed standard for open space per thousand population while ignored the necessity of following those standards in their proposed development plans. With the exception of Rangpur Master Plan, there is no evidence in the physical planning of urban areas in Bangladesh at any level regarding maintaining specific standards for various levels of playgrounds—such as playlot, playground and playfield. Necessity of play and its impact on the development of children and youth was not duly recognized in the past planning efforts in various cities in Bangladesh.

Playgrounds that are accessible for common people are quite few in numbers in major urban areas of the country. Most of the playgrounds, currently available in the metro areas of Bangladesh are presently under the ownership of various institutions—mostly belongs to various educational institutions. Only few playgrounds are owned by city corporations, development authorities or municipalities – that are accessible to common people. Playgrounds accessible for common people are quite inadequate also in the Paurashavas in Bangladesh. Like the metro cities, most of the playgrounds under the ownership and supervision of various institutions, thereby barring the accessibility of common people into these grounds.

This study suggests various standards for sports and play facilities for urban areas in Bangladesh which could be a guideline for planners and policy makers while planning for various cities in Bangladesh. Respective development authorities, city corporations or municipalities should develop their play facilities by following proper planning standards in respective urban areas for planned and sustainable development of the cities.

Acknowledgement

This research has been funded by Ministry of Science and Information & Communication Technology’ of Government of Bangladesh under Bangabandhu Fellowship of Science and ICT.

References

- APA, 1965. Standards for Outdoor Recreational Areas. American Society of Planning Officials, Information Report No. 194, Historic PAS Report Series. USA.
- BIP, 2018. Playgrounds in Dhaka City: Existing Context and Way Forward, Research Report from Bangladesh Institute of Planners (BIP), Dhaka.
- Brown, A. J., and Sherrard, H. M. 1951. *Town and Country Planning*. Melbourne: Melbourne University Press.
- City of London, 2009. *Infrastructure Delivery Plan*, (draft for consultation). City of London, UK.
- City of Oxford, 2008. *Oxford Comprehensive Plan*. Fisher & Arnold, Inc. City of Oxford, United Kingdom.
- Daley, J. 2000. *Recreation and Sport Planning and Design*, 2nd Edition. Champaign, IL: human Kinetics.
- Damphu Structure Plan, 2006. Department of Urban Development and Engineering Services (DUDES), Ministry of Works and Human Settlement, Bhutan.
- DAP, 2010. *Detail Area Plan of Dhaka Metropolitan Development Plan for Dhaka City*, Rajdhani Unnayan Kartipakkha, Ministry of Housing and Public Works, Government of Bangladesh.
- De Chiara, J. & Koppelman, L. 1982, *Urban planning and design criteria*. New York : Van Nostrand Reinhold, USA.
- Gallion, A. & Eisner, S. 1986. *The Urban Pattern*. Van Nostrand Reinhold Company, New York. USA.
- Green, C. 2012. *CSIR Guidelines for the provision of social facilities in South African settlements*. CSIR Built Environment. Pretoria, South Africa.
- Khan, A. M. & Kalam, A. K. M. A (2015), People’s Perception on Community Facilities: Findings from Selected Urban Areas in Bangladesh; Jahangirnagar Planning Review, Vol-13.

- Khan, A. M. (2016), Developing Planning Standards for Community Facilities: A Study in the Context of Urban Areas of Bangladesh, Unpublished Doctoral Thesis, Department of Urban and Regional Planning, Jahangirnagar University
- Khan, A.M. 2012. Planning Standards for Recreational Facilities and Open Space in the Context of Urban Areas of Bangladesh. A Research under the 'Faculty Research Grant' of Jahangirnagar University in 2011-12.
- Lancaster, R.A. 1990. Recreation, Park, and Open Space Standards and Guidelines. Ashburn, VA: National Recreation and Park Association. USA.
- LGED, 2010. Development of Planning Standard for Preparing Master Plans for Pourashavas under UTIDP. Upazila Towns Infrastructure Development Project (UTIDP), Local Government Engineering Department, Government of Bangladesh.
- Mcgraw-Hill. 1999. *Time saver standard for site planning*. Mcgraw-Hill Publishing Company. USA.
- Planning Department of Hong Kong, n. d. Planning of Open Space in Hong Kong. Available at www.prdbay.com/htdocs/20110330140004e, Planning Department, Hong Kong.
- PPDC, 2008. Guidelines for Planning of Facilities in KwaZulu-Natal, Provincial Planning & Development Commission – Standard, The Planning Initiative Team. Series Volume 84. Pietermaritzburg: KwaZulu-Natal Provincial Planning & Development Commission.
- Putrajaya Local Plan, 2002. *Manual of Physical Planning Guidelines for Putrajaya Local Plan*. Perbadnan Putrajaya, Malaysia. available at, www.putrajaya.gov.my/.../e.../LPP_Precints_789_and_10_part1.pdf.
- RAJUK, 1995. *Dhaka Metropolitan Development Plan (DMDP)*. Rajdhani Unnayan Kartipakkha; Ministry of Housing and Public Works, Government of Bangladesh.
- RAJUK, 2014. Draft Plan Report for 'Preparation of Structure Plan for RAJUK under CRDP', Rajdhani Unnayan Kartipakkha. Dhaka.
- Rao, M. P. 2001. *Urban Planning – Theory and Practice*. CBS Publishers and Distributors, Darya Ganj, New Delhi.
- RDP, 2015. *Regional Development Plan (Draft) for Dhaka City (2015-35)*, Rajdahani Unnayan Kartipakkha, Dhaka.
- RMDP, 2004. *Structure plan, Master plan and Detailed Area plan for Rajshahi 2004- 2024*, Rajshahi Development Authority, Rajshahi.
- RMP (Draft). 2014. Interim Report of 'Preparation of Structure Plan, Urban Area Plan and Detailed Area Plan for Rangpur City Corporation Under District Towns Infrastructure Development Project, Prepared by EPC-DATEX-EKAR Consortium, Local Government Engineering Department, Government of Bangladesh.
- Veal, A. J. 2008. Open Place Planning Standards in Australia: in Search of Origins. School of Leisure, Sport and Tourism Working Paper 5, Lindfield, NSW: University of Technology, Sydney.

Building Vulnerability Assessment and Social Appraisal of Retrofit in Lalmatia, Dhaka

Mst. Tanzila Aktar Shawon *
Md. Akter Mahmud **
Mohammad Mizanur Rahman ***
Michio Ubaura ****

Abstract: Bangladesh is one of the earthquake vulnerable countries in the world. Since Bangladesh is close to the boarder of two active plates (in the west side the Indian plate and in the east and north and east side the Eurasian plate), the country is invariably at risk of an earthquake that may be harmful and could kill people in an instant. With the increasing rate of earthquake, people's natural tendency to be afraid because experts consider them what is going to be occurred to them as warning. In this study the AHP- Analytical Hierarchy process and Multi Criterion Analysis process is used to identify the earthquake vulnerability for Lalmatia study area. The AHP method is used here to assign the weight of vulnerability factors from the expert's opinion. In our study the weigh for six earthquake vulnerable factors were fixed and by this AHP method and the priority of vulnerable aspects were also identified by this method. This research reveals that 5 buildings are very high vulnerable to retrofit in the first step plan and 13 buildings are high vulnerable to retrofit in the second step plan. About 298 buildings are less vulnerable to retrofit. The retrofitting of structural components shouldn't be conducted for only an individual component or groups of components. The good performance of the entire structural system must be ensured. Retrofitting strategy was determined based on the results of technical assessment. The result and method of this study may be used to recognize the earthquake vulnerability in Lalmatia and also to take planning and mitigation measures against earthquake in Dhaka City.

Keywords: Analytical Hierarchy Process, Retrofit, Social Appraisal, Vulnerability, Priority for Retrofit.

Introduction

Bangladesh is vulnerable to earthquake because of the existence of several fault lines and tectonic plate boundaries (CDMP, 2014). Previous experience of earthquake and rapid urbanization, high population growth rate, high density and development of economic arrangements increasing the vulnerability for earthquake (CDMP, 2014). The capital city Dhaka with estimated population in 2020 is roughly 2.1 million (UN, 2020) and density of population is 44,500 per sq.km. (UN Habitat, 2020) which puts heavy pressure in the city. With high density this megacity continues to expand with extremely ill planned and increasing earthquake vulnerability. The earthquake risk and infrastructure protection in

* Postgraduate Research Student, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka -1342, Bangladesh. E-mail: shawonurp17ju44@gmail.com

** Professor, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka -1342, Bangladesh. E-mail: aktermahmud@yahoo.com

*** Assistant Professor, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka -1342, Bangladesh. E-mail: mizanurp@gmail.com

**** Professor, Department of Architecture and Building Science, Tohoku University, Japan. E-mail: ubaura@tohoku.ac.jp

Dhaka is now a main concern as the earthquake disaster risk index ranks Dhaka as one of the 20 most risky cities in the world (Ahmed and Ahmed, 2010).

Without appropriate planning Dhaka is developing very fast and as a result we can see more incidents like the collapse of the Begunbari building on June 1, 2010. The buildings were built on wet land and in earthquake the soil liquefaction may happened on this building (Rahman, 2010). The Meteorological Department and BUET has identified about 90 earthquakes were occurred in Bangladesh through May 2007 to July 2008. Among the identified history of earthquakes, nine of which are above five on the Richter scale and 95 % of which were within a radius of 600 km of Dhaka city (Ferdousi and Rahman, 2010. CDMP (2009a, 2009b, 2009c) assessed that the Madhupur fault generates 7.5 Mw magnitude for Dhaka city. According to this assessment, out of total 3,26,000 buildings, approximately 270,604 buildings will be at least moderately damaged which comprises over 89% of total building stock. Besides 238,164 buildings will be damaged beyond repair. Around 260,788 and 182,450 people will die respectively for an earthquake taking place at 2:00 AM and 2:00 PM. Around 1,527,668 people will be displaced aftermaths an earthquake (CDMP, 2009a, 2009b, 2009c).

An assessment was piloted by ADPC from February 2008 to August 2009 in Bangladesh Government initiatives titled on Comprehensive Disaster Management Program (CDMP). According to this study, a 7.5 magnitude earthquake originated from the Madhupur fault could have killed at least 1,30,000 people if the earthquake had been attacked in daytime in Dhaka. An earthquake of 8 Richter scale created close to the Chittagong of plate boundary fault 2 may kill about 69,900 people living in the capital if the earthquake had been attacked in daytime. There may 13,600 people need to be hospitalized and 61,288 people may need first aid treatment (CDMP), 2010. Thus, the capital city Dhaka and Bangladesh both are extremely vulnerable to earthquake and considering these aspects the earthquake vulnerability in Lalmatia study was conducted. The Study was also conducted to find out the public's perception about the willingness of building owners to retrofit the existing building against earthquake vulnerability.

Literature Review

Dhaka is a fast growing and densely populated (21 million as of 2020, Dhaka population 2021) mega city, with a population density 48,000 per sq.km (Amin, 2018) and a large number of high-risk apartments (Akhter, 2010). Northeastern cities in Bangladesh have a higher risk of earthquake than other part (Hossain, 1998). According to CDMP, if an earthquake occurs on a Richter scale 6 magnitude then near about 78,323 buildings will be fully destroyed with an economic loss of US\$ 1,075 million (CDMP, 2010). The other probabilistic thinking is that if the Madhupur fault generates 7.5 Mw magnitude earthquake then about 72,316 buildings in the city will be totally damaged and 53,166 partially with an economic loss about US\$32948. This earthquake may also kill about 131,029 people instantaneously with an injury of 32,948 people (CDMP, 2010). United Nations published reports said that Dhaka and Tehran are very high-risk city (Rahman, 2004) although large earthquake has not been occurred yet historically (Khan, 2004). The large earthquake not occurred yet but some planning intervention may reduce the earthquake vulnerability in Dhaka city (Rahman, Tariq and Sharmin, 2020). To reduce the vulnerability the seismic retrofitting is one of the strong mitigation measures for the

pre disaster (Solberg et al. 2010). In Japan the seismic retrofitting is applied in buildings to bring the seismic code revision of 1981 (Fukuyama, 2006). To take the retrofitting measures (Solberg et al. 2010), leading to ground use rules and community relocation (Erdick, 2008) and emergency evacuation preparedness and awareness (Chakrabarty, Rahman and Ubaura, 2020) can help to mitigate earthquake vulnerability. A parallel study in Lalmatia carried out and six affecting factors against earthquake vulnerability in five subcategories has been considered as like as construction year, population, road width, building use, area of parcel and building vulnerability (Shawon et al. 2021). Vulnerability assessment for both structural and non-structural elements are very important during and after earthquake event (Rahman, Tariq and Sharmin, 2021). All the literature above mentioned are discussed about the vulnerability loss and some methods to identify the vulnerability. But there was the research gap to find out the people's perception about the willingness of building owner to retrofit the existing buildings in response to building vulnerability. So, considering some vulnerability issues this research study was carried out to display the existing building's vulnerability in Lalmatia area in Dhaka City and also to identify the building owner's attitude about the willingness to retrofit the existing buildings.

Purpose and Objectives of the Research

The main aim of this research is to measure the earthquake vulnerability in Lalmatia, and the willingness to pay by the landowner to retrofit the existing buildings of Lalmatia area, Dhaka city. The following objectives have been taken to implement this aim:

- Assessing the earthquake vulnerability in the existing buildings in Lalmatia area, Dhaka.
- To investigate the willingness of building owner to retrofit the existing buildings.

Conceptualization and Theoretical Framework

Turkish Method

The Turkish government and the Japan International Cooperation Agency (JICA) came forward to implement a regional earthquake assessment and rehabilitation program after the 1999 earthquake in Kocaeli and Duzce. The Turkish method Level-1 is used in this work. The first phase of the survey from the sidewalk was conducted by observers through a walkdown visit.

Survey Parameters

The parameters selected in the Level-1 survey to indicate building vulnerabilities are as follows:

- *General Information:* Type of existing building, Number of building stories, Year of construction, Number of occupants, Maintenance record.
- *Appearance of a Soft Story:* Yes or No
- *Appearance of Heavy Overhangs:* Yes or No
- *Discernible Building Quality:* Good, Moderate or Poor
- *Pounding possibility Between Adjacent Buildings:* Yes or No
- *Appearance of a Short Columns:* Yes or No

The intensity of ground motion at a particular location depends mainly on the efficiency of the distance and the local soil conditions. There is a strong relationship between PGV (Peak Ground Velocity) and local soil shear wave velocity (Chowdhury, 1993). So PGV was selected to represent the intensity of ground motion in the study. Peak ground velocity (PGV) can be taken between 40 cm /sec to 50 cm /sec (Wu *et al.*, 2003). Thus, Zone II (40 <PGV<60) is considered for calculating performance scores because our study area matched the same characteristics with Zone II. The different base scores described in Table 1 which were determined based on the number of stories and the earthquake risk level in the site building.

Table 1: Base Score (BS) and Vulnerability Score (VS) for Concrete Buildings

| Number of Stories | Base Scores (BS) | Vulnerability Scores (VS) | | | | |
|-------------------|------------------|---------------------------|----------------|------------------|--------------|----------|
| | Zone II | Soft Story | Heavy Overhang | Apparent Quality | Short Column | Pounding |
| 1 or 2 | 130 | 0 | -5 | -5 | -5 | 0 |
| 3 | 120 | -15 | -10 | -10 | -5 | -2 |
| 4 | 100 | -20 | -10 | -10 | -5 | -3 |
| 5 | 85 | -25 | -15 | -15 | -5 | -3 |
| 6 or 7 | 80 | -30 | -15 | -15 | -5 | -3 |

Source: Sucuoglu and Yazgan, 2003

Building Seismic Performance

At first the vulnerability factors are fixed by the walk down survey and then the location of the building is determined by its location (by GPS survey), the seismic Performance Score (PS) can be finding out by using Eq. 1. The base score (BS), the Vulnerability Scores Multiplies (VSM) and the vulnerability scores (VS) to be used in Eq. 1 and the corresponding values are represented in tables 1 and 2.

$$PS = (BS) - \sum(VSM) \times (VS) \dots\dots\dots (1)$$

Table 2: Scale for the Vulnerability Scores Multiplies (VSM) and Parameters

| | |
|----------------------|----------------------------------|
| Soft story | Exists = 1; Does not exist = 0 |
| Heavy Overhang | Exists = 1; Does not exist = 0 |
| Discernible Quality | Good = 0; Moderate = 1; Poor = 2 |
| Pounding possibility | Exists = 1; Does not exist = 0 |
| Short columns | Exists = 1; Does not exist = 0 |

Source: Sucuoglu and Yazgan, 2003

Then, the vulnerability value is found which is equal to the PS divided by BS. If this computed value is low, the vulnerability of the building will be high. Decide the range of vulnerability levels (Table 3) in the study (very low, low, medium, high and very high) and develop a map of vulnerability of concrete buildings.

Table 3: Vulnerability Score

| Score | Vulnerability Level |
|-------------|---------------------|
| 0.1 to 0.2 | Very High |
| 0.21 to 0.4 | High |
| 0.41 to 0.6 | Moderate |
| 0.61 to 0.8 | Low |
| 0.81 to 1 | Very Low |

Source: Sucuoglu and Yazgan, 2003

This assessment process of building vulnerability is only applicable for RCC (pucca) building. In this process tin shed and semi pucca buildings are not evaluate for the vulnerability assessment of the study area.

Multi Criteria Decision Making (MCDM)

To evaluate the impacting factor and to identify their weight the Multiple-criteria decision-making (MCDM) is very popular term in our study. The MCDM is divided into two terms and they are Multi-Objective Decision Making (MODM) and Multi-Attribute Decision Making (MADM), (Zimmermann, 1991). These two methods give a clear statement for the decision maker as like as to make various quantities and weight to assess the study. By analyzing the limitations, weight, characteristics of the factors and the alternatives these systems are very essential to give a formal analysis in any research study. The MCDM method used here for the solution of our study problem. They also accept some parameters such as homogeneity in the problem solution (Malczewski, 1999). They can discuss thematic parameters such as the weight and the common set of values if there arises conflict among various actors. The optimal field suitability and the specific range of a particular indicator can be mapped by the results of MCDM. The researcher can then discuss and relate the results by overlaying their maps one by one to get the overall situation which are actually geographically representation of their results.

Spatial Multi-Criteria Decision Making (MCDM)

This spatial multi criteria decision involves a set of alternatives. With respect to the given set of evaluation criteria, a choice of one or more alternatives is made (Jankowski, 1995 and Malczewski, 1996). It is extremely different from traditional MCDM techniques. Spatial multi criteria requires criterion value information, alternatives location in adjunct to the decision makers preferences. That means analysis results also depend on the value of judgements engaged in the decision-making process. Two considerations are pre-eminent importance for this analysis: (1) GIS component like data storage, acquisition, retrieval, manipulation and capability of analysis and (2) MCDM analysis component like aggregation of spatial data and preference of decision makers diverse decision alternatives (Carver, 1991; Jankowski, 1995 as cited in Siddayao 2014).

The Analytical Hierarchy Process

The AHP approve the decision maker to create a model consisting complex problem in hierarchical way indicating the relevance of the goal, criteria, sub criteria and alternatives. It additionally permits the decision maker to incorporate each subjective and objective concerns during this method (saaty, 1980). The AHP method involves the following basic steps:

- Construction of the hierarchy
- Comparative judgements or executing data collection to achieve pair wise comparison data of the hierarchical structure on elements.
- Overall priority rating construction (Harker & Vargas, 1987)

At the first stage, decision makers necessity to break down the complex multiple criteria decisions into its component. At each level of hierarchy, the criteria and sub criteria are not equally important to taking decision. In the decision-making task, AHP is able to consolidate and combine the evaluations of the criteria and alternatives by group or individual (Eastman *et al.*, 1993). AHP and Multi criterion analysis is using in this study to explore the vulnerability of Lalmatia against earthquake torment. Table 4 explore that six parameters were selected to vulnerability appraisalment and then six factors are further categorized into five sub criteria. Factors affecting the vulnerability against earthquake is shown in table 4.

Table 4: Vulnerability Measuring Factors and Weight

| Major Criteria | Sub Criteria | Vulnerability | | | | |
|---|------------------------------|---------------|------|--------|-----|----------|
| | | Very High | High | Medium | Low | Very Low |
| Building Vulnerability by Turkish Method | Weight | 9 | 7 | 5 | 3 | 2 |
| | 0.1-0.2 | • | | | | |
| | 0.21-0.40 | | • | | | |
| | 0.41-0.60 | | | • | | |
| | 0.61-0.80 | | | | • | |
| | 0.81-1 | | | | | • |
| Construction Year of Building | Before 1970 | • | | | | |
| | 1970-1980 | | • | | | |
| | 1981-1990 | | | • | | |
| | 1991-2000 | | | | • | |
| | 2001-2010 | | | | | • |
| Population per Building | 91 and more | • | | | | |
| | 90-71 | | • | | | |
| | 70-40 | | | • | | |
| | 40-21 | | | | • | |
| | 20-0 | | | | | • |
| Area of Parcel | Less than 100 m ² | • | | | | |
| | 101-250 m ² | | • | | | |
| | 251-500 m ² | | | • | | |
| | 501-1000 m ² | | | | • | |

| Major Criteria | Sub Criteria | Vulnerability | | | | |
|---------------------|-------------------------------|---------------|------|--------|-----|----------|
| | | Very High | High | Medium | Low | Very Low |
| | More than 1000 m ² | | | | | • |
| Road Width | Less than 10' | • | | | | |
| | 10'-20' | | • | | | |
| | 21'-30' | | | • | | |
| | More than 30' | | | | • | |
| Building Use | Residential | | • | | | |
| | Educational | | | • | | |
| | Commercial | | | | • | |
| | Service Facilities | | | | | • |
| | Official | | | | | • |

Source: Developed by authors, 2019

Pair-wise Comparison

Saaty (1980) developed the pair wise comparison method in the context of AHP (Analytical Hierarchy Process). Comparisons create a ratio matrix, as it takes the parameter in pair wise to produce the relative weights. Personal and subjective judgements can be taken in comparison (Chen, 2016). At a given time, two elements compared of this analysis can reduces the conceptual complexity (Muralidhar *et al.*, 1990; Parvoti, 1992; Saaty, 1980). Three task involves in this analysis:

- A comparison matrix development at each level of hierarchy
- Relative weights calculation for each element of hierarchy
- Consistency ratio estimating to check the judgment consistency (Li *et al.*, 2006)

Table: 5: Relative Important Scale of Point Intensity

| Importance Ranking | Meaning | Description |
|-------------------------------------|--|---|
| 1 | Equal rank | Two events give equal judgment |
| 3 | Weak position of one over another | Results are marginally favor one action over another |
| 5 | strong importance | Result strongly favor one activity over another |
| 7 | Confirmed importance | Strongly favored an activity and its control is validated in practice |
| 9 | Entire importance | Strongly favored an activity and is the maximum potential order of confirmation |
| 2, 4, 6, 8 | Middle values between the two-neighboring decision | Negotiation is required |
| Reciprocals of Above Nonzero | If i shows the above nonzero numbers in the activity when comparing to activity j, then j will be common values in relating with i | |

Source: Saaty, 1980

Analytical hierarchy used the 9-point Scale for ranging from 1 to 9 (indifference or equal importance to extreme preference or absolute importance) which is shown in table 5. In this comparison matrix elements are compared in pairs in each level with respect to importance. The decision maker evaluates the contribution of each factor in this pair wise comparison matrix. In the comparison matrix at a given level will be reduced to a number of square matrices $M = [a_{ij}]_{n \times n}$ as in the following:

$$\begin{bmatrix} a_{11} & a_{12} & \dots & a_{1n} \\ a_{21} & a_{22} & \dots & a_{2n} \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{n2} & \dots & a_{nn} \end{bmatrix}$$

Vector of weights, $[W = W_1, W_2, \dots, W_n]$ is calculated after formed the pair wise comparison matrix. The matrix $M = [a_{ij}]_{n \times n}$ is normalized by Equation 2.

$$a_{ij} = \frac{a_{ij}}{\sum M} \dots \dots \dots (2)$$

For all $j=1, 2, \dots, n$.

To calculate the CR, the CI (Consistency Index) and RI (Random Index) for each level of matrix of order “n” can be obtained from Equation 3 and Equation 4.

$$CI = \frac{\lambda_{max} - n}{n - 1} \dots \dots \dots (3)$$

$$RI = \frac{1.98(n - 2)}{n} \dots \dots \dots (4)$$

Then CR is computed using Equation 5

$$CR = \frac{CI}{RI} \dots \dots \dots (5)$$

Here, RI is Random Consistency Index shown in table 6 which is obtained from randomly generated pair wise comparison matrix. The comparisons are acceptable if $CR < 0.1$ and the comparisons are not acceptable if $CR > 0.1$ which is inconsistent judgements. One should revise and reconsider in such cases with their original values in this matrix A

Table 6: Random Index

| | | | | | | | | | | | | | |
|-------------------|---|------|-----|------|------|------|------|------|------|------|------|------|------|
| N(number) | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Random Index (RI) | 0 | 0.58 | 0.9 | 1.12 | 1.24 | 1.32 | 1.41 | 1.45 | 1.49 | 1.51 | 1.48 | 1.56 | 1.57 |

Source: Saaty, 1980

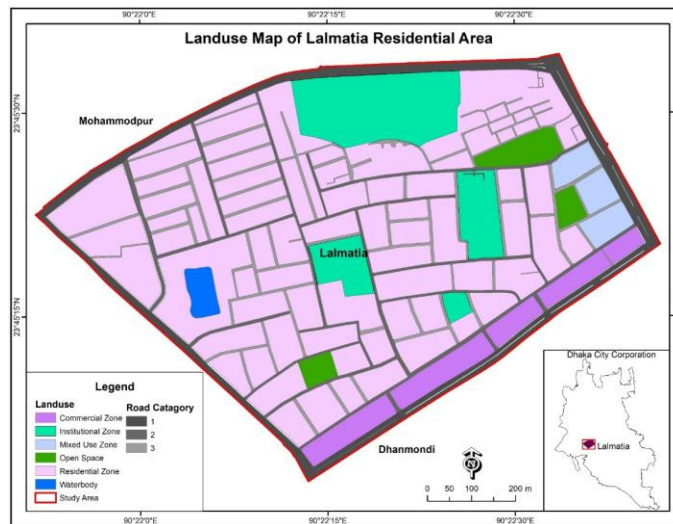
Methods

Physical observation and checklist survey has been comprised the survey of residential building to collect information regarding building number of stories, construction year of building, population per building, road width, Appearance of soft story, heavy overhangs, Discernible building quality, Appearance of short columns, pounding possibility between

adjacent building, area of parcel, building use etc. For the study, sample size is calculated through the following procedure: Total population (building) size (N) = 1647, Error level (e) = 5%, Confidence level 95% and sample size was determined as 316. The sample was collected randomly in Lalmatia study area. Secondary data were collected from thesis papers, earthquake management related books, seminar papers, articles, journals, etc.

Objective Variable Matrix

| Objectives | Variables | Data | Techniques |
|---|---|--|---|
| Assessing earthquake vulnerability in the existing buildings. | <ul style="list-style-type: none"> ✓ Num. of stories ✓ Num. of residents ✓ Construction year of the building ✓ Road width ✓ Appearance of soft story ✓ Presence of Heavy overhangs ✓ Discernible building quality ✓ Appearance of short columns ✓ Land parcel ✓ Possibility of Pounding ✓ Building use | Primary sources (Field observation, checklist survey) | Measurement Technique: Turkish Method Spatial Distribution: GIS & RS |
| Investigating the willingness of building owner to retrofit the existing buildings. | <ul style="list-style-type: none"> ✓ Willingness to pay ✓ Reduction level of Vulnerability ✓ Retrofit Cost | Primary sources (In-Depth interview/ Focus Group Discussion (FGD)) Secondary sources (Related Organization: RAJUK, DCC, ADPC) | Technique: Analytical Hierarchy Process Spatial Distribution: GIS |



Map 1: Land use Map of Lalmatia

Source: Developed by authors, 2019

Existing Conditions

There are different types of buildings structure in Lalmatia area like RCC, masonry and semi-pucca building. The masonry structures are more vulnerable during earthquake. There are different building stories in Lalmatia area. Five to six stories buildings are more (31.3%) than other stories in the study area. It is found that, there are few buildings aged more than 30 years. In Lalmatia area, the highest number of buildings constructed around 1985 to 1995 (almost 957 buildings constructed). Figure 1 shows that after 2005, construction and reconstruction of buildings is increasing most. Between 2005 to 2014, almost 47.8% buildings are constructed. Before 2005 building construction was more in 1985 to 1995. Again, construction of structures is increasing in last ten years. The use of the buildings is divided into some exact ranges that define the actual utilize of the building. In Lalmatia area most of the building is used as residential purpose. Some other type of building uses a like commercial, community services and mixed use also founds.

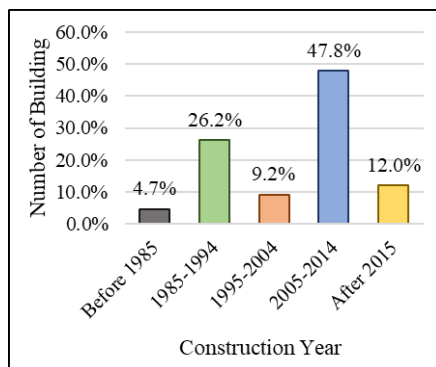


Figure 1: Construction Year of Building

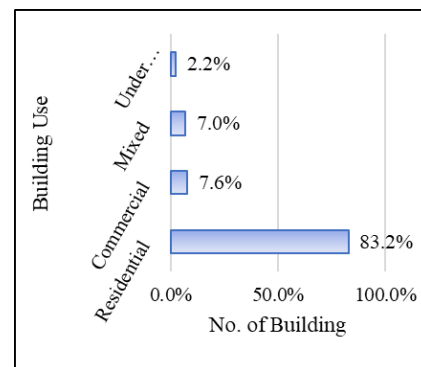


Figure 2: Percentage of Building Use

Source: Field survey, 2019

Amid the surveyed buildings, about 38% of buildings with heavy overhangs in Lalmatia area were found (Photograph 1). It was found that in most of the upper floor from two to three feet consist of heavy overhang. 4% building with short column was found in the study area (Photograph 2). Buildings with short columns typically convey serious damage throughout severe earthquake. Nowadays the ground story (Photograph 3) is left open for parking in large number i.e., without having any partition walls (RCC) between columns in the ground. The percentage of soft story buildings is less than the buildings without soft story. Almost 38% buildings having soft story. It is found that, majority of the apparent building quality is good in Lalmatia area, and it is almost 59.2%. It is found from field survey that the majority of the buildings has pounding possibility (59.8%) (Photograph 4).



Photograph 1: Appearance of Heavy Overhang Photograph 2: Appearance of Short Column

Source: Field survey, 2019



Photograph 3: Appearance of Soft Story Photograph 4: Pounding between Adjacent Building

Source: Field survey, 2019

Overall Vulnerability Scoring by AHP

AHP (Analytical Hierarchy Process) is a flexible, effective, and simple method to decision-making process. Saaty proposed the AHP method in 1980. It is a familiar method that decomposes several level decision-making problems through creating hierarchical relationship between different levels. This method uses comparison as a pair to distribute weights of different factors that helps to measuring the relative importance through the using Saaty's 1 to 9 level scales. Consistency ratio (CR) is also calculating to verify the judgmental coherence. The accepted consistency ratio must be about 0.1 or less. This method includes following three steps-

- Two comparison matrices generation
- Calculation of weights for different factors

- Calculation of agreement ratio

Generating of a Binary Comparison Matrix

According to Saaty, a pair wise comparison matrix is a numerical relationship between two elements that appreciate more important element. In the numerical representation the weight of each factor compared together. Matrix $n \times n$ (in this case 6×6) record the results that also called binary comparison matrix $A_{ij} = [a_{n \times n}]$. In Analytical Hierarchy Process, all elements of the metric are positive and concerning the “reverse condition” (the weight of j in regard to i will equal to $1/k$, if the weight of i in regard to j equals to k). In every binary comparison matrix, we will have two numerical quantity of A_{ij} and $1/A_{ij}$.

Calculation Step for Different Factors

To determine the weight of each factor, a comparison matrix (table 8) has been developed. Calculation step includes the following:

Step 1: Calculating the Weighted Sum Vector (WSV) (table 8)

Table 8: Vulnerability Factors Comparison in Pair

| Pair-wise comparison matrix (A1) | | | | | | |
|---|----------------|-------------|------------------|---------------|-------------|-----------|
| Criteria | BV | CY | Pop ⁿ | AoP | RW | LU |
| Building Vulnerability by Turkish Method (BV) | 1 | 7 | 7 | 7 | 7 | 7 |
| Construction Year of Building (CY) | 0.143 | 1 | 2 | 4 | 6 | 7 |
| Population per Building (Pop ⁿ) | 0.143 | 0.5 | 1 | 2 | 4 | 5 |
| Area of Parcel (AoP) | 0.143 | 0.25 | 0.5 | 1 | 2 | 3 |
| Road Width (RW) | 0.143 | 0.167 | 0.25 | 0.5 | 1 | 2 |
| Land Use (LU) | 0.143 | 0.143 | 0.2 | 0.333 | 0.5 | 1 |
| Sum | 1.71471 | 9.06 | 10.95 | 14.833 | 20.5 | 25 |

Source: Developed by authors, 2019

Step 2: Calculating the Inconsistency Vector (IV) (table 9).

Step 3: Obtaining λ_{\max} (table 9).

Table 9: Criteria Weight Calculation

| Normalized Pair-wise comparison matrix | | | | | | | A2 | A3 = $\sum A1 \times A2$ | A3 ÷ A2 |
|--|-------|-------|------------------|-------|-------|------|-----------------|-----------------------------|--------------|
| Criteria | BV | CY | Pop ⁿ | AoP | RW | LU | Criteria Weight | | |
| BV | 0.583 | 0.773 | 0.639 | 0.472 | 0.342 | 0.28 | 0.515 | 3.912 | 7.599 |
| CY | 0.083 | 0.110 | 0.183 | 0.270 | 0.293 | 0.28 | 0.203 | 1.350 | 6.645 |
| Pop ⁿ | 0.083 | 0.055 | 0.091 | 0.135 | 0.195 | 0.20 | 0.127 | 0.810 | 6.401 |
| AoP | 0.083 | 0.028 | 0.046 | 0.067 | 0.098 | 0.12 | 0.074 | 0.459 | 6.238 |
| RW | 0.083 | 0.018 | 0.023 | 0.034 | 0.049 | 0.08 | 0.048 | 0.292 | 6.100 |
| LU | 0.083 | 0.016 | 0.018 | 0.022 | 0.024 | 0.04 | 0.034 | 0.210 | 6.181 |
| Average | | | | | | | | | 6.527 |

Source: Developed by authors, 2019

Step 4: Calculating the inconsistency index: defined by equation (6).

$$CI = \frac{\lambda_{max} - n}{n - 1} = \frac{0.527}{5} = 0.105 \dots\dots\dots (6)$$

Step 5: Calculation of Inconsistency Ratio (CR): defined by equation (7). If this ratio is less or equal to 0.1, the consistency will be acceptable.

$$CR = \frac{CI}{RI} = \frac{0.105}{1.24} = 0.085 \dots\dots\dots (7)$$

Here,

CI= Consistency Index,

RI= Random Consistency Index,

n= Number of Attributes

and λ_{max} = Weighted Matrix

RI is derived from the table 6.

In our result the CR is estimated 0.085 which means there is a consent in result because we know that if CR is greater than 0.1 then the result should be reassessed and if $CR \leq 0.1$ then it should be agreement in the result.

Overall Vulnerability Evaluation

The weights for the criteria are computed to evaluate the overall vulnerability using AHP method and afterwards vulnerability map of Lalmatia is prepared based on vulnerability level.

Findings

With the value of Turkish Method at the time of AHP model the range of vulnerability levels are depended on huge population, very high construction age, narrow road and building use is residential. AHP consider all multiple aspects that can affect any building vulnerability and weighted with seismic buildings related factors and present the vulnerability category.

Example

Table 10: Vulnerability Score of Very High Vulnerable Building by AHP Method

| Uniq_id | No of stories | Vulnerability Score by Turkish Method | CY | Pop ⁿ | AoP | RW | LU | Score |
|---------|---------------|---------------------------------------|------|------------------|--------|----|----|-------|
| 761 | 6 | 0.19 | 1990 | 55 | 46.87 | 22 | R | 42 |
| 1571 | 6 | 0.20 | 1998 | 52 | 322.13 | 22 | R | 36 |
| 1406 | 10 | 0.20 | 1990 | 76 | 118.97 | 22 | R | 42 |
| 1532 | 6 | 0.19 | 1990 | 54 | 283.68 | 26 | R | 40 |
| 970 | 5 | 0.18 | 1990 | 37 | 106.43 | 22 | R | 38 |

Source: Developed by authors, 2019

According to AHP method, by giving a priority on very high vulnerable and high vulnerable building (Turkish method) represents the three priority ranking. In case of very high vulnerable buildings (total buildings 5), 2 buildings get first priority (Uniq_id 761 and 1406), 1 get second and 2 gets third priority (Uniq_id 1571 and 970). In case of high vulnerable building (total buildings 21), 13 buildings get first priority, 5 gets second and 3 gets third priority. This priority list represents priority-based retrofitting. Figure 4 represent the priority list of high vulnerable building.

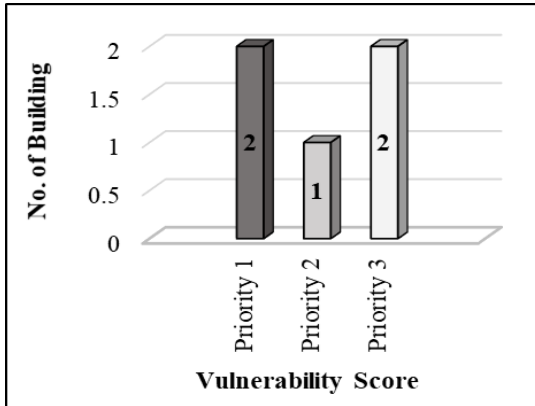


Fig 3: Priority of Very High Vulnerable Building

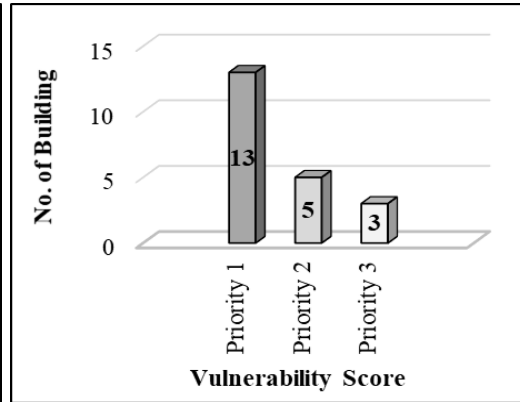
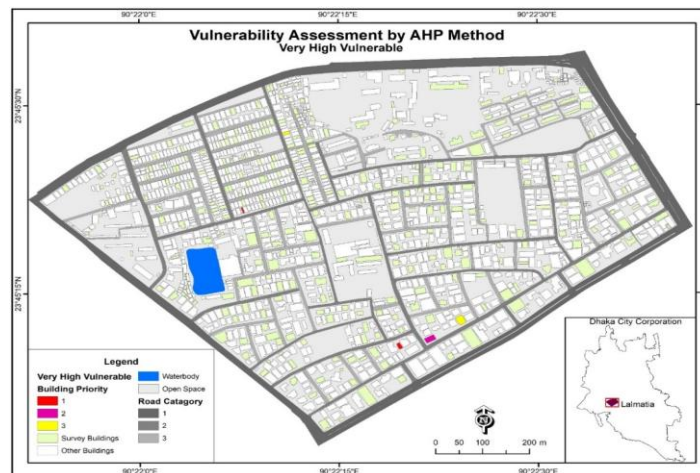


Fig 4: Priority of High Vulnerable Building

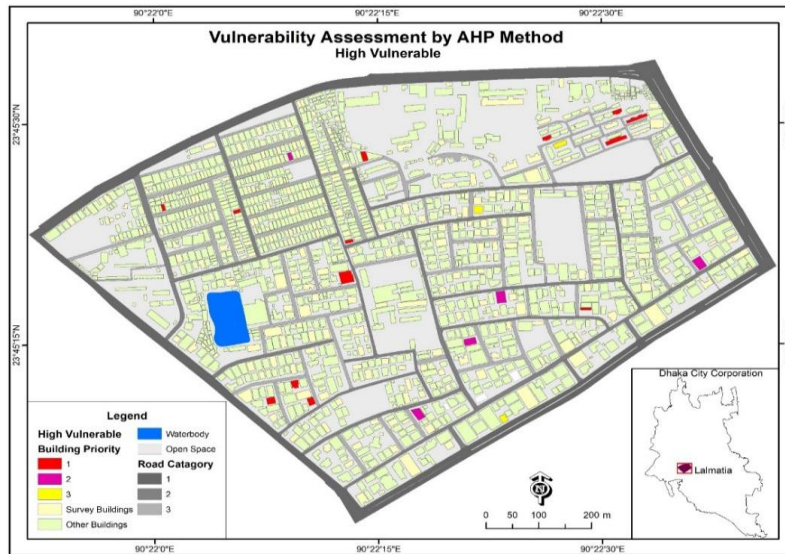
Source: Field survey, 2019

AHP method is used only for very high vulnerable building and a high vulnerable building in Lalmatia area. Map 2 represent the very high vulnerable building priority and map 3 represent the high vulnerable building priority. It was concluded that (based on AHP results), 5 building of very high vulnerable get most priority for retrofitting. And then 21 buildings get priority for retrofitting.



Map 2: Vulnerability Assessment Map (1) by AHP Method

Source: Developed by authors, 2019



Map 3: Vulnerability Assessment Map (2) by AHP Method

Source: Developed by authors, 2019

Willingness to Pay for Retrofit

Some people want to retrofit by thysel in Lalmatia area. Some people have already started to retrofit. Several people believe that developer can’t work properly. That’s why small size of respondent is agreed to retrofitting by developer. Responses show that awareness but that willingness to participate in a retrofit project is modest and is limited. Survey result shows that (Table 11), majority of the respondent are not agreed to retrofit for above mentioned prioritized 26 buildings. About 92% respondent are not agreed to pay for retrofit. Only 8% respondent are agreed to retrofitting.

Table 11: Willingness to Pay for Retrofit

| | Yes | No |
|---------------------------------|-----|-----|
| Willingness to Pay (Percentage) | 2 | 24 |
| Percentage | 8% | 92% |

Source: Field Survey, 2019

The major barrier to building retrofit is the direct economic loss to the building owner. Findings stated that if the initial cost of implementation can be reduced then more building owners will adopt adequate mitigation measures. That can be through the provision of financial and market-based incentives such as low interest loans and tax deductibles. These incentives would be strengthening their ability to adopt appropriate seismic mitigation measures through reduce the owners initial retrofit and building maintenance costs.

Retrofit Plan Based on Vulnerability

Based on findings by applying AHP method, can make short term and medium-term plan (table 12) for retrofit. Short term plan for very high vulnerable building and medium term plan for high vulnerable building can be taken. It can be taken to year wise retrofit plan based on priority. For short term plan, Priority-1 building can be taken emergency retrofit within first year. Priority-2 building can be retrofitted within second year and Priority-3 building within third year.

Table 12: Short Term and Medium-Term Plan for Retrofit

| Short term: 1-3 year (very high vulnerable building) | | | Medium term: 4-6 year (high vulnerable building) | | |
|---|----------|--------------------|---|----------|--------------------|
| Year for Retrofit | Priority | Number of Building | Year for Retrofit | Priority | Number of Building |
| 1 st Year | 1 | 2 | 4 th Year | 1 | 13 |
| 2 nd Year | 2 | 1 | 5 th Year | 2 | 5 |
| 3 rd Year | 3 | 2 | 6 th Year | 3 | 3 |

Source: Developed by authors, 2019

In case of medium-term plan, Priority-1 building can be taken emergency retrofitted within fourth year. Priority-2 building can be retrofit within fifth year and Priority-3 building within sixth year. This short term and medium-term plan will be applied only for very high vulnerable and high vulnerable buildings.

Conclusion

Earthquakes is the tremendous threat for the economy, and well-being of the cities, and communities. Thousands of buildings may collapse because of strong earthquake. These strong earthquakes create serious loss of a city that imposed to urban elements. Due to scarcity of digital technology and data, risk zoning map have not been prepared yet for Dhaka city against earthquake stress. The proper analysis of the vulnerable element against earthquake helps to identify risk level of damage. The present study, AHP method has been applied for weighting major building components and the results are also drawn up using GIS with several factors to stimulate earthquakes. Retrofit is one of the important techniques to reduce damage against earthquake hazard. But in the study more people can't be interested as because lacking of information and financial support. The concept of social retrofitting helps to individuals and communities that enable them to recover and react against earthquake hazards. This study will support the planning and development community as well as developers to exercised reconstruction techniques that was not properly exercised yet. The model that applying in this study will expressly contribute in the vulnerability appraisal and also helps to take mitigation attempts of Dhaka city against earthquake.

References

- ADPC (2009), 7.5 quake can kill 1.3 lakh in Dhaka: survey. Bdnews24.com, 21 September, 2009. Retrieved on 01 November, 2020 <https://bdnews24.com/bangladesh/2009/09/21/7.5-quake-can-kill-1.3-lakh-in-dhaka-survey>
- Ahmed, S. & Ahmed, H. (2010). Disaster risk and risk mitigation in Dhaka other cities, *UNICEF*, Dhaka, Bangladesh.
- Akhter, S.H. (2010). Earthquakes of Dhaka: Environment of capital Dhaka-Plants, wildlife, gardens, parks, air, water and earthquake. *Asiatic society of Bangladesh*. pp. 401-426.
- Amin, M. A (2018). Dhaka remains the world's most densely populated city. Retrieved from <https://www.dhakatribune.com/bangladesh/dhaka/2018/10/14/dhaka-remains-the-world-s-most-densely-populated-city>. Published on October 14th, 2018.
- Carver, S. J. (1991). Integrated multi-criteria evaluation with geographical information systems, *International Journal Geographical Information Systems*, 5(3), pp. 321–339.
- CDMP. (2009a). Earthquake Contingency Plan for Dhaka City. Dhaka: Comprehensive Disaster Management Program (CDMP), Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh, Phase 1.
- CDMP. (2009b). Risk Assessment of Dhaka, Chittagong and Sylhet City Corporation Area. Dhaka: Comprehensive Disaster Management Program (CDMP), Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh, Phase 1.
- CDMP. (2009c). Vulnerability Assessment of Dhaka, Chittagong and Sylhet City Corporation Area. Dhaka: Comprehensive Disaster Management Program (CDMP), Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh, Phase 1.
- CDMP. (2010). Dhaka city at risk of massive destruction. The daily star, January 24, 2010. Retrieved on 15 October, 2019, from <https://www.thedailystar.net/news-detail-123247>
- CDMP. (2014). Scenario Based Earthquake Contingency Plan of Mymensingh Municipality Area. Comprehensive Disaster Management Programme (CDMP), Ministry of Food and Disaster Management, Government of the People's Republic of Bangladesh.
- Chakrabarty, A., Rahman, M. M. and Ubaura, M. (2020). "Assessment of Emergency Evacuation Preparedness for Seismic Hazard in an Urban Area" in the 17th World Conference on Earthquake Engineering, 17WCEE, Sendai, Japan - September 13th to 18th 2020, pp. 6h-0004, 1-9. Sendai, Japan. Retrieved from https://www.researchgate.net/publication/344407256_Assessment_of_Emergency_Evacuation_Preparedness_for_Seismic_Hazard_in_an_Urban_Area.
- Chen, Y., Kou, G., Ergu, D. & Lin, C. (2016). Pairwise comparison matrix in multiple criteria decisions making. *Technological and Economic Development of Economy*, 22(5), 738-765.
- Choudhury, J. R. (1993). Seismicity in Bangladesh. Bangladesh University of Engineering and Technology (BUET), Dhaka.
- Dhaka Population 2021, (2021). World Population Review. Retrieved from <https://worldpopulationreview.com/world-cities/dhaka-population> on 27 February, 2021
- Eastman, J.R., Jin, W., Kyem, P.K. and Toledano, J. (1993) Raster Procedures for Multicriteria/Multiobjective Decisions. *Photogrammetric Engineering and Remote Sensing*, 61, 539-547.
- Erdik, M. (2008) Durukal, E. Earthquake risk and its mitigation in Istanbul. *Nat. Hazards*, 44, 181–197.
- Ferdousi, S. & Rahman, M.T. (2010). Earthquake in Bangladesh: How much are we prepared to face it? *Bangladesh J Pathol*, 25(1): 1-2.

- Fukuyama, H. (2006) Application of high-performance fiber reinforced cementitious composites for damage mitigation of building structures. *J. Adv. Concr. Technol.*, 4, 35–44.
- Harker, P. T. and L. Vargas (1987). “The Theory of Ratio Scaled Estimated: Satty’s Analytical Hierarchy Process.” *Management Science*, 33(11): 1385-403.
- Hossain, K.M. (1988). Tectonic significance and earthquake occurs in Bangladesh. *J. Geol. Soc.* 7: 1-11.
- Islam, R., Islam, M. N. & Islam, M. N. (2016). Earthquake risks in Bangladesh: causes, vulnerability, preparedness and strategies for mitigation. *ARNP Journal of Earth Sciences*, 5(2).
- Jankowski, P. (1995). Integrating geographical information systems and multiple criteria decision-making methods. *International Journal of Geographical Information Systems*, 9(3), pp. 251–273.
- Khan, A.A. (2004) “Earthquake hazard: Dhaka city perspective”, *The Daily Star*, Vol. 5 No. 40.
- Li, D., Peng, M. and Shao, Z. (2006). Design and Implementation of Urban Management and Service Grid Based on Spatial Database. In: ASIA GIS international conference, March 9-10, 2006, Johor, Malaysia, pp: 123-131.
- Malczewski, J. (1996). A GIS-based approach to multiple criteria group decision making. *International Journal of Geographical Information Systems* 10(8), 955-971. 18.
- Malczewski, J. (1999). *GIS and Multicriteria Decision Analysis*. 1st Edn., Jonh Wiley, Toronto. pp: 392. ISBN 0471329444.
- Muralidhar, K., Santhanam, R. and Wilson, L. (1990) Using the analytic hierarchy process for information system project selection. DOI:10.1016/0378-7206(90)90055-M
- Partovi, F.Y. (1992). Determining what to benchmark: An analytic hierarchy process approach. *International Journal of Operations & Production Management*, 14 (6): 25-39, 1992. DOI: 10.1108/01443579410062068.
- Rahman, M. A., (2010). Dhaka in Danger. *The daily star*, June 10, 2010. Retrieved on 05 November, 2020 from <https://www.thedailystar.net/news-detail-142043>
- Rahman, N. (2014). Vulnerability assessment of earthquake and fire hazard and formulating risk reduction strategies at community level. MURP thesis, Bangladesh University of Engineering and Technology, Dhaka, Bangladesh.
- Rahman, M. G. F. (2004) “Seismic Damage Scenario for Dhaka City”, M.Sc. Engg. Project thesis, Department of Civil Engineering, BUET, Dhaka.
- Rahman, M. M., Tariq, A. A. and Sharmin. S. (2020). “Planning Intervention in Emergency Evacuation to Minimize Hazard Impact: A Case Study of Old Dhaka and Dhaka Export Processing Zone.” *Journal of Earthquake Science and Soil Dynamics Engineering*, 3(3), 1–16. <http://doi.org/10.5281/zenodo.4305837>.
- Rahman, M. M., Tariq, A. A. and Sharmin, S. (2021). Earthquake Resilience at District Level Hospital in Bangladesh: Tactic of Non- Structural Elements and Social Awareness. 1st Croatian Conference on Earthquake Engineering, 1CroCEE, Zagreb, Croatia. March 22 to 24, 2021. Edited by Laksusic, S. and Atalic, J.
- Saaty, T.L. (1980). *The Analytic Hierarchy Process: Planning, priority setting, resource allocation*. New York: McGraw Hill.
- Saaty, T.L. (1994). *Fundamentals of Decision Making*. RSW Publications. Retrieved on 21 October 2020, from <https://books.google.com.bd/books?id=wct10T1bbIUC&printsec=frontcover#v=onepage&q&f=false>

- Shawon, M. T. A., Mahmud, M. A., Rahman, M. M., Ubaura, M. and Rashied, M. (2021). Evaluating Earthquake Vulnerability Using Analytical Hierarchy Process (AHP) and Social Appraisal of Retrofitting in Lalmatia, Dhaka. 1st Croatian Conference on Earthquake Engineering, 1CroCEE, Zagreb, Croatia. March 22 to 24, 2021. Edited by Laksusic, S. and Atalic, J.
- Siddayao, G.P., Valdez, S.E. and P.L. Fernandez (2014). Analytic Hierarchy Process (AHP) in spatial modeling for floodplain risk assessment. *Int. J. Mach. Learn. Comput.*, 4 (5), pp. 450-457
- Solberg, C., Rossetto, T., & Joffe, H. (2010) The social psychology of seismic hazard adjustment: Re-evaluating the international literature. *Nat. Hazards Earth Syst. Sci.*, 10, 1663–1677.
- Sucuoglu, H. & Yazgan. U. (2003). Simple Survey procedures for Seismic Risk Assessment in Urban Building Stocks. Retrieved October 15, 2019, from https://www.researchgate.net/publication/242234736_Simple_Survey_Procedures_for_Seismic_Risk_Assessment_in_Urban_Building_Stocks
- UN, (2020). UN World Urbanization Prospects. Retrieved from <https://worldpopulationreview.com/world-cities/dhaka-population/>. Accessed on 08/06/2020.
- UN Habitat, (2013). These are the world's most crowded cities. World Economic Forum. <https://www.weforum.org/agenda/2017/05/these-are-the-world-s-mostcrowded-cities/>. Accessed 19 July, 2020.
- Wu, Y. M., Teng, T. L., Shin, T.C. and Hsiao, N. C. (2003), Relationship between Peak Ground Acceleration, Peak Ground Velocity, and intensity in Taiwan, *Bulletin of the seismological Society of America*, Vol.93, No. 1, pp. 386-396.
- Zimmermann, Hans-Jürgen. (1991) Fuzzy Set Theory — and Its Applications. DOI: 10.1007/978-94-015-7949-0.

Open Space in Dhaka: Identifying the Factors of Public Inaccessibility

Fatima Kabir Sharna*
Halima Begum**

Abstract: An open space can only become successful by ensuring accessibility accurately. In the language of planning, open space can only become successful after achieving accessibility for each and every people of society. Increasing demand for housing and other facilities from rapid population growth has been a strong reason for the decrease in open spaces. This study tries to represent the existing open space accessibility condition of Dhaka city, by studying a playground and a park. To explain the aspects of accessibility, this research focuses on public accessibility instead of place accessibility. Several reasons behind inaccessibility, such as- social, economic, cultural, and environmental aspects have been discovered in detail. In regard to determining the prohibiting factors, both user and non-user group data have been assessed from a fixed catchment area. Factors that affect the people most with its impacts and create inaccessibility in spite of having open spaces in close proximity are the main issues focused on this article. Along with the primary survey results of a playground and park, this study has also included model-based theories to determine the findings. Findings show that accessibility declines mostly for safety issues, restrictions, and close association with travel expenses to reach there. The ultimate output of the research can be stated in one sentence that, accessibility is not only the thing which can only be described by proximity or physical distance but also public accessibility, which is the most significant determinant for using any open space.

Introduction

For encouraging a variety of physical activity behaviors; parks, playgrounds or green open spaces are significant elements in a neighborhood (Koohsari et al, 2015). The visible components and functions at any open space may bring several effective changes in life, e.g. - better health, improved social cohesion, and economic benefit. (Nasution & Zahrah, 2014). In urban planning, characteristics like quality and quantity of any open space of a community are considered as eliciting for increasing public attachment. The spatial configuration and number of parks and their approachability determine their potential access for general people (Chen et al, 2017). Neighborhood parks can be flourishing and responsive through the presence of mass people by the self-reinforcing process. For this reason, accessibility can be better addressed and defined if measures can be taken into account in terms of time, cost, distance, or population for neighborhood planning (Tabassum and Sharmin, 2013). Neighborhood people are the significant role players for those parks on the basis of their perceptiveness and usage from socio-economic status, cultural pattern and overall lifestyles (Gobster, 2001; Carmona *et al.* 2003). Therefore some attributes (image and comfort, linkage and access, activities and usage) may also strengthen the responsiveness of open spaces depending on the neighborhood (Tabassum and Sharmin, 2013).

* Assistant Urban Planner, Dhaka South City Corporation, Former Student of DURP, Jahangirnagar University, Savar, Dhaka-1342, Email: atpsharna.dscc@gmail.com

** Professor, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka-1342, Email- halima.sayeed@juniv.edu

'Appearance of' and 'Accessibility to' urban open spaces has been well defined in various studies, as lack of it is can exaggerate the disability of a city (Rashid, 2003). Upon till now, especially in megacities, the amount of public spaces are decreasing day by day and losing approach due to lack of preservation. Several discussions already have been made on public open spaces from the developed countries, however only a few discussions have represented about developing world. In urban areas, ideas about open spaces are old but a more contextual analysis with proper acknowledgement of the supplies and boundaries; paths for public open space planning in a sustainable way in Bangladesh may get revealed (Afroz, 2009).

Concept of accessibility and its measuring models

The key components of accessibility can be defined with three features; it needs to be physically or structurally accessible, socially accessible and compulsorily should have free using scope for general people. (Benn and Gaus, 1983). Developed country contexts treat "distance" as the major factor for measuring accessibility. Maruani and Amit Cohen (2007), identified accessibility as one such parameter that has the capacity of addressing public needs (Maruani and Amit-Cohen, 2007). Defined as the ease with which people can reach desired activity sites (James et al., 2009), accessibility has been widely used as a significant indicator to evaluate the extent to which planning has been able to adequately respond to population's demand for urban open space.

Yang et al, 2016, stated three measures of accessibility. **Simple proximity measure** includes minimum distance and travel cost which automatically gives locational benefit for people to reach and access open space. In this study, minimum travel distance and travel costs have been considered for measuring accessibility. The **gravity model** is evaluated on the basis of attraction, and friction factors. Attraction factors are described by the characteristics of the destination, such as size and amount of facilities, which can provide more comfort to the users, and friction factors are based mostly on distance and cost of reaching at the destination. Both attraction and friction factors have been gathered to justify the accessibility situation of study areas. The **utility model** is based on random utility theory. The probability of a choice by individual changes is dependent on the relative utility of the choice (Yang et al, 2016). To justify users' choice and non-users perception, this study depends on utility model.

Studies from the developed world suggest that around 80% of total users go to public space on feet where proximity is the most significant issue for determining the usage. The accessibility of public open spaces is usually simulated as the most significant factor dominating public use within a distance of 300 to 400 meters from a user to an open space accepted as an essential threshold. Above 400 meter distance reduces recurrence automatically (Chen et al, 2017)

In the context of Dhaka, DMDP (1995-2015) fixed standard of 0.16 acres area for parks/open space for per 1,000 populations which is equivalent to the area of 4 parks for

the community services of 25,000 populations as per Urban Area Plan (1995-2005). The Detailed Area Plan (2010) proposed a prime standard of 0.96 acre/1,000 population at neighborhood level Park and play field as 0.32 acre/1,000. Dhaka Structure Plan (2016-2035) recommends 0.86 acre/1,000 population for play fields and 0.25 acre/ 1000 population for community parks.

Problems regarding Open Spaces of Dhaka City

Once Dhaka was called the ‘Venice of the Orient’ for having large open spaces with lushness of nature. With the rapid urbanization, the amount of open spaces is decreasing gradually. Lack of consciousness, initiative and most of all insensitivity of both public and private sectors towards ecology, environment and sociological factors have led to Rapid decline of open spaces and water bodies and increasing loss of accessibility to the open spaces and water bodies (Khan, 2014).

Suchana (2013) described public opinion and expectation of the quality of the parks and greeneries are low in Dhaka. “Whilst other forms of recreation from indoor sports and leisure to computer games are aggressively marketed to urban populations, a visit to local parks can seem a less exciting option. Two —leisure cultures now co-exist; one is represented by the recreational culture of regular park users, parents with young children, teenagers hanging out, joggers, the other is the fitness cultures based on fitness centers, aerobics, swimming pools, etc. While the majority of people walk to parks, the majority of users of indoor leisure facilities drive to them. Fewer and fewer adults and children are walking and cycling and over time this has contributed to the climate of empty green space, empty street”, mentioned by Suchana (2013). She also explained that “Children and young people’s use of the outdoors have become increasingly restricted and consequently has declined in the last fifteen years. Many children and adults have better access to commercial and household entertainment. They are often encouraged to use these facilities because of parental restriction and fears.” Her few more perceptions are as following:

- Lack of quality and maintenance of open spaces: Deteriorated condition and insufficient provision of service facilities; such as- seats/ relaxing space, toilets, and playing instruments for children.
- Higher crime rate and inappropriate behavior: Concern of the presence of drug and alcohol users, unexpected characters that make people feel threatened.
- Hygiene and safety: Concern for safety and psychological issues, such as- feeling of fear and vulnerability.
- Degraded environment: Condition of vandalism, litter and graffiti.
- Disappearance of variety
- Inaccessibility: Due to heavy traffic and unplanned public space location becomes difficult to access smoothly. And thus parents don’t allow their children to go there by own.

- Specific few people are rare users of open space as- elderly group, specially challenged/ disable group, and minor communities.”

Only 21.6% urban poor of Dhaka city can be able to visit museums, zoos, and parks for recreational purposes. Around 50% of kids wanted at least a playfield nearby their accommodation and 85% of children desired to have parks with amusement features within close proximity (around 3.2 kilometers) of their home (Hossain, 2005; Ahmed & Sohail, 2008).

Objectives and Methodology of the Research:

The key research question of this study is to determine the forbidding factors for accessibility of open space. Two objectives corroborate this research question: to determine the present scenario of public accessibility and for identification and explaining the discouraging aspects of inaccessibility of open space. For this purpose, the study has been conducted in a public park and community playground. 120 questionnaire surveys were conducted in the selected study area; 70 for open space users, and 50 for deprived households. The purposive sampling method was followed for selecting respondents. The respondents included the existing user group of selected open space, and irregular user residents from the catchment area. For the identification of non-user groups, the 1 kilometer catchment of open space adjacent area has been selected for this study. Different information, such as- types of activities performed by the users, existing infrastructure facilities of the park were gathered based on a pre-defined checklist. The questionnaire surveys were based on two types of questions (open and close ended) and opinions have been transcribed, tabulated for data analysis. Data have been classified into perceptions and presented in percentage.

Study Area

According to “The Daily Star (2004)”, Dhanmondi Abanhoni Club, which has been occupying the Abahoni playfield for four decades with unauthorized structures and without permission, was turned into a limited company named after Lieutenant Sheikh Jamal in August 2009. Abahoni playground can be considered as one of the safest open spaces of Dhaka city as approximately 90% of users (field survey, 2017) have mentioned their perception positively about it. It has around 26 Bigha of land which is used for practicing cricket, football, and several indoor games also. The community people and the outsider who are enlisted in different sports clubs get the chance to practice their games in the field instead of a monthly fee around 1000-1500 BDT. The local persons also get a chance to play here. There is a football ground, a large number of batting and bowling nets for the players. The national players of Bangladesh Football team also practice here. The guardians of the young players also come with them and enjoy the moments by walking around the field. It is now under construction for the Sheikh Kamal Krira Complex. It was open for a long time but now it has a boundary fence made of iron around the whole of it and only 1 entry point (Field Observation, 2017).

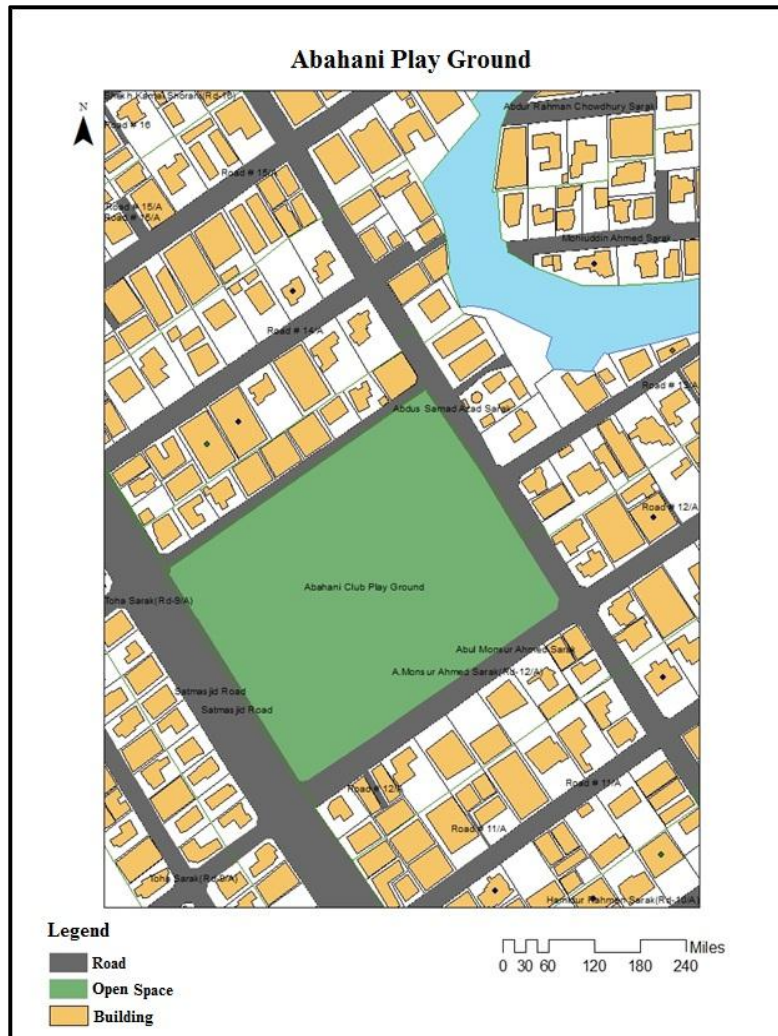


Figure 1: Map of Abahoni Playground

Source: Developed by author, 2017 with the help of DAP, 2014

On the other hand, Mirpur Budhhijibi Shahid Minar Complex is currently being used as an open space which comprises 67 acres land (combining graveyard and monument). The location of this space is in Mirpura Thana, DNCC Ward no 12 (Budhhijibi Complex Office, 2017). The surrounding people come here for jogging whereas adolescents come here for cycling, playing etc. Walkways are completely paved around whole space. According to Buddhijibi Complex Office (2017), comfortable sitting arrangements have been developed here along with two artificial water bodies.

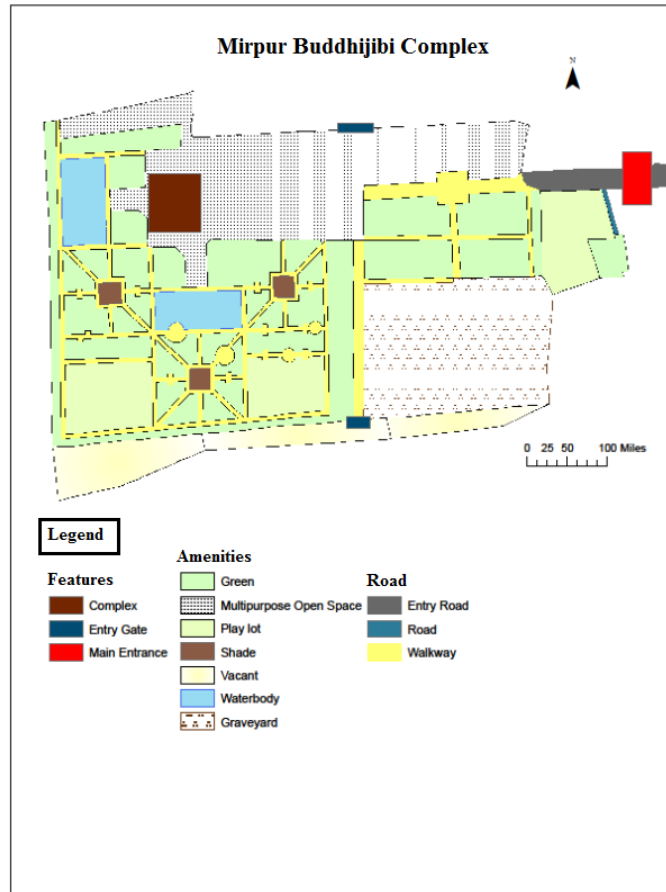


Figure 2: Map of Buddhijibi Shahid Minar Complex, Mirpur

Source: Developed by author, 2017 with the help of DAP, 2014 and Buddhijibi Complex Office

Influencing Factors for using Open Space: Perception of User Group

Due to private ownership, the accessibility of the park was restricted for few months in 2016, but for the declaration of High Court, the construction of the mini-stadium was banned, which might be able to make inaccessibility. Now the park is accessible for all people without the membership of the club also. Most of the users of this playground are male, but females are also influential users. The major age groups of users are 20-30 years who are involved with different clubs for playing cricket and football. Most of the users are well to do with their occupation and upper and middle class from their family background. For this reason, they are capable of paying the club for training fees which is monthly 1500-2000 BDT.

People use the playground in morning and afternoon. In maximum cases, girls visit the playground in the morning for their sports activities and boys' practices sports in the afternoon session. Clubs always fix the schedule of practicing of users with their convenient time and maximum time users depend on them.

Most of the users are interested in using this open space for the attraction of training facilities provided by clubs. These clubs (currently 12 are active) organizes tournaments on a weekly basis, and guardians are mostly interested in the participation of their children in it. Guardians do jogging or simple relaxation by sitting during their children's playtime. People from the internal community people visit the playground in maximum days than outsiders, but they have another option like Dhanmondi Lake, so their visit also limits sometimes. In terms of quality aspect of the study area, the most attractive components have been traced as the playing equipment as paved space and separated porting for playing cricket, green play lot for playing football. Greeneries' over the areas also preferable by the users.

Maximum people reach at the open space by non-motorized vehicles and walking is another most convenient way for reaching of the community users. A 15-minute rickshaw ride is the most desired kind of trip of the users. For disabled people, accessibility conditions are not so good. In spite of disabled children playing here, the structural condition of this playground has not been developed much and a person with a wheelchair cannot enter without anybody's help.

Almost 70% of people think that the playground is accessible for all gender, though few people have answered in negative (30%) on the question of the entrance of transgender people. Maximum people (80%) have answered in positive in the question of restriction and unauthorized occupancy. Little bit problems occurred due to the irritation of thieves, which are not from outside the field or not by professional thieves or hijackers and it is caused only during the match time for keeping problems.

Maximum users are dissatisfied with the present waste management system. There are lacking waste bins and waste collectors and for this reason wastes like packets, paper cartons are kept lying in the field after the afternoon session of playing and morning users have to go through these wastes during their practice sessions. Most of the users are NMT users to reach the open space but walking distance covered users also share a major portion of the total users. The average transportation fee is 40 BDT daily for maximum users, who use this space regularly. But for irregular and long-distance users, a maximum of 300 BDT are required to reach in the open space and they go there for a maximum of 2 days of the week only in the time of tournaments.

Since the playground is now under private ownership, cultural or religious use of open space is strictly prohibited and doesn't hamper the regular user's accessibility. The major function of this study area is only the celebration of match-winning. Maximum users are satisfied with the outlook of the overall field, but critical environmental constrains as heavy rain rigidly hampers the accessibility by creating water logging in the field and there is no proper management systems for preventing water storage and transfer.

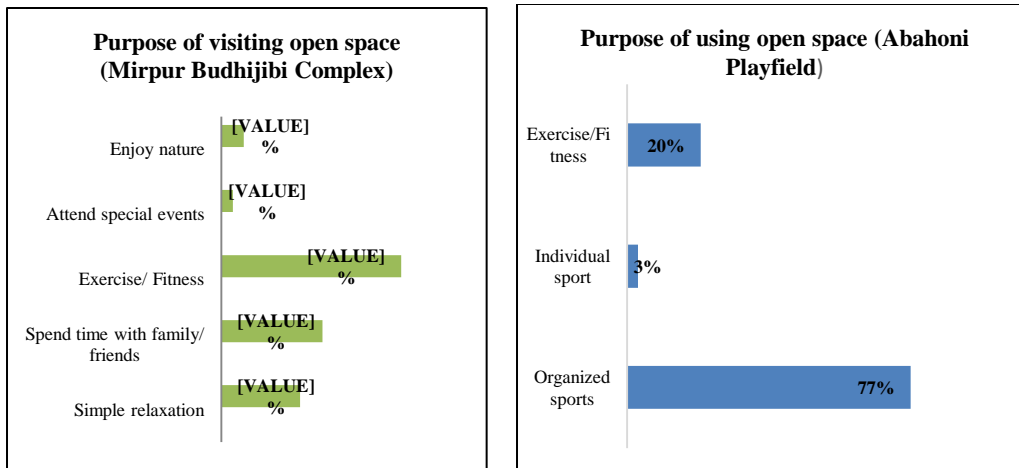


Figure 3 & 4: Purpose of visiting open space

Source: Field Survey, 2017

From the study analysis, it has been revealed that the prime users were male at the open space from nearby communities, female users also share influential portion of the total number which defines the equal accessibility for all age group.

Socio-economic profile analysis of the user group identified the highest users from middle income segment. Highest users are revealed as students in terms of profession. The reason behind using and timing of the open space has been identified as casual. However, joggers usually do morning walk and exercise activities. Frequency of park using is 54% in morning and 46% in afternoon by all user groups.

It is traced in the study that people from nearby communities intend to visit park with a regular 2 or 3 days interval. People within communities can also visit 2 or 3 times within a week since they have more options of open spaces such as- school playground and staff quarters play lot.

The prominent findings of the study assures that distance is the significant element for the determination of accessibility. Analysis revealed that maximum people complete their respective distances for reaching the open space on foot. Non-motorized transport is also the convenient way for community and outside users. A short rickshaw ride is the most favorite way for most of the users for reaching. For disabled group, accessibility conditions have been found as satisfactory. The well-constructed walkways and enlarged ramp complement the usage of disabling groups conveniently. The majority (80%) users have voted positively in the context of gender accessibility as the park is accessible for all gender however a few (20%) have objections regarding transgender.

For being public property, the park has provided the advantage of mass people usage. The majority (97%) has no confusion about unauthorized or illegal occupancy. It remains closed for users only before 1 month of the intellectual day celebration. As

mentioned earlier, the prime inclination for the people is the well-paved and managed walkway, shades as well as the natural beauty of the selected open space.

Prohibiting Factors for using Open Space: Perception of Non-User Group

80% of households, who are non-users right now, shared their experiences of visiting the playground before. Existing non-user group has shared their opinion on stopping the use due to the fear of getting hit by balls and security aspect. The amount of increased transportation cost and club fees for training are also responsible factors for their inaccessibility. The inaccessibility is acute for the middle age group people and for their jogging or lack of sitting arrangements.

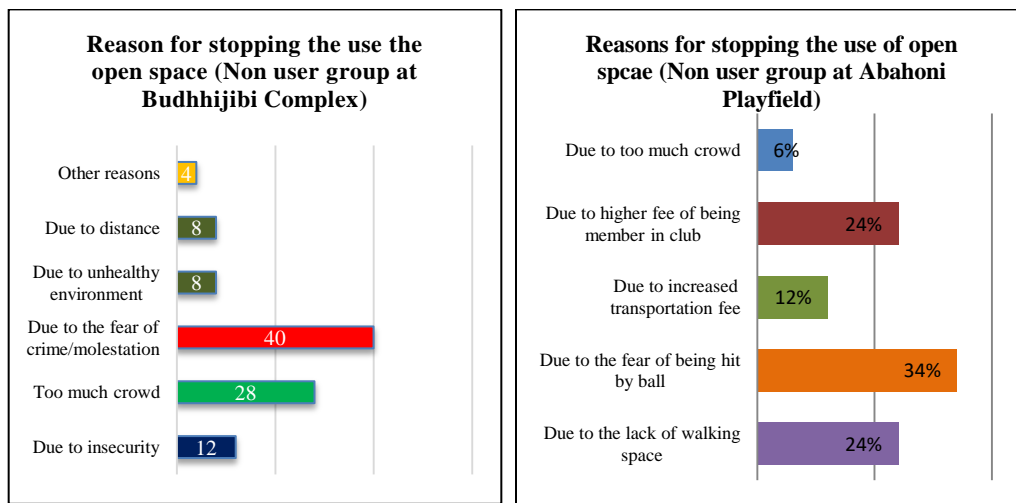


Figure 5 & 6: Prohibiting factors for using open space

Source: Field Survey 2017

The analysis revealed that majority of the non-user households (96%), were regular user of the open space before. They described for not using the open space for several reasons, such as- time shortage, work burden etc.

The field survey analysis has revealed that- due to the fear of crime/molestation, non-users (40%) stopped the use of the open space; 28% had stopped for heavy crowd; 12% on the basis of insecurity; and 8% for long distance and unhealthy environment. Illegal activities were also significant reason for stopping the usage. From field survey, it is depicted that the majority (64%) of the non-users were not interested in using the open space due to social factors, 20% for the reasons of cultural factors, 12% had stopped for the economic factors and 4% had stopped for environmental factors.

Following table is the summary of findings of comparative analysis of the study areas on the basis of prohibiting factors

Table 1: The Summary finding of prohibiting factors

| Prohibiting Factors | Abahani Playground | Buddhijibi Shahid Minar |
|------------------------------|---|---|
| Social Factors | For both user and non-user group, several social factors like safety, quality issues, different age and gender group accessibility is better than any other open spaces. | In spite of having well-furnished infrastructure with natural beauties, accessibility is greatly hampered for the chances of occurring illegal activities, safety issues. |
| Economic Factors | Amount of transportation fee for user group is increasing day by day which is an alarming prohibiting factor of accessibility for user group in the perception of users. | For having the accessibility for all class people and especially for lower income group, larger portion is satisfied with the transportation cost from distanced communities. |
| Cultural Factors | Due to private ownership, cultural and religious program arranging scope is very limited in this playground, only limited cultural programs are organized that doesn't hamper accessibility of people | Accessibility is hampered for the purpose of paying tribute to the martyrs as well as several cultural and religious activities. |
| Environmental Factors | Inconvenient environmental factor as excessive rain prohibits accessibility due to poor management of playground. | Environmental factors never prohibits accessibility of both user and non-user group due to its well-furnished infrastructures. |

Source: Developed by authors, 2017

Application of Accessibility Measurement Models

By applying the theories of accessibility measuring models, the following aspects have been summarized:

Table 2: The Summary attribute by using accessibility measuring tool

| Name of the Models | Summary of attributes | Findings |
|----------------------------------|---|---|
| Simple Proximity Measures | Minimum travel cost and distance | Accessibility patterns changes with the minimum distance and travel cost. In both study areas, distance is the major factor which prohibits people to use the open spaces regularly; travel cost also prohibits the accessibility of middle income group users to enjoy their recreation. |
| Gravity Model | Attraction factors of open space, satisfaction level of users | In both study areas, attractive factors are different on the basis of the typology. In Abahoni |

| Name of the Models | Summary of attributes | Findings |
|---|---|--|
| | | Playground, the major attractions are mostly service based, neither resource based. On the other hand, in Budhhijibi Shahid Minar complex, prime attraction is greeneries, long paved walkway which is accessible as well by comparatively lower income group. However, due to the concern for safety, accessibility differs. |
| Utility-Based Model & Activity Based Model | Modes of transportation, income of user group | The relationship between average incomes of user group is one of the most determinant factors of accessibility. NMT distance is acceptable for most of the users but always it is not possible to reach at open spaces through NMT, for high volume of traffic, users can't avail rickshaw always. The average expenditure of transport purpose is a tough call to take for the middle income users. |

Source: Developed by authors, 2017

Conclusion

The study findings reveal that accessibility is not only dependent on the concept of place but also on the quality of it. In densely populated urban areas open spaces must be the most vibrant and accessible. But their significance is not remembered always in the debate about landscape architecture and urban design. In Dhaka rapid growth of the urban population has caused the huge encroachment of open space due to increasing demand on land for housing and other urbanization need. But still, there is enough scope, to rectify the flaws with planning and design, and thus enhance the accessibility and use of the open spaces. Public accessibility is diverting day by day due to all types of factors such as social, economic, political, and environmental factors. It's not only creating feelings for a specific group, a user, or a non-user. Nothing is so perfect in the present condition of public accessibility in the capital of Dhaka. Open spaces as parks and playground suffering most from accessibility problems, because people think about recreation after livelihood. But for achieving a healthy nation, open spaces are required for taking a deep breath, for giving a child some fresh air, and at least the chance of playing. This study is an attempt to trace the preventive factors that discourage a person from visiting open space. Users- who are presently using open spaces by covering all the barriers and problems and non-user groups who cannot use due to their problems, prohibiting factors. Both groups have been selected from a 1 km catchment area. Factors that affect the people most with its impacts and create inaccessibility in spite of having open spaces in close proximity are the main issues focused on this study. The ultimate output of the study can be stated in one sentence that, accessibility is not only the thing

that can only be described by proximity or physical distance. It's the choice of the public, which determines the accessibility. So for considering accessibility, public accessibility identification and consideration are a must for planning perspective.

References

- Afroz, R. 2009. Sustainable open space planning and the informal sector: a case study of Dhaka, Bangladesh. (Thesis). University of Hong Kong, Pokfulam, Hong Kong SAR.
- Ahmed, A., & Sohail, M.O. 2008. Child's play and recreation in Dhaka City, Bangladesh. *Municipal Engineer: Proceedings of the Institute of Civil Engineers*, 161 (4): 263 – 270.
- Analysis of Site Area, Accessibility, and Attractiveness. *International Journal of Chemical, Environmental & Biological Sciences (IJCEBS)*, 4(2):114-120.
- Barnett, G., Beaty, R.M., and Doherty, M. 2005. Urban greenspace: connecting people and nature. *Environment* 13
- Benn, S. I., & Gaus, G. F. 1983. The liberal conception of the public and the private. *Public and private in social life*: 31-65.
- Campbell, K. 2001. Rethinking open space, open space provision and management: a way forward. Report presented by Scottish Executive Central Research Unit, Edinburgh.
- Carmona, J. M., Cortes, J. L., Gamboa, J., & Mendez, F. 2003. Noncommutativity in field space and Lorentz invariance violation. *Physics Letters B*. 565: 222-228.
- Chen, Y., Liu, T., Xie, X.H. and Marusic, B. 2017 What Attracts People to Visit Community Open Spaces? A Case Study of the Overseas China Town Community in Shenzhen, China. *International Journal of Environmental Research and Public Health*, 13, 644.
- DAP 2008, Preparation of Detailed Area Plan for Dhaka Metropolitan Development Plan (DMDP) Area, Draft Final Report submitted to RAJUK. September 2008
- District Statistics 2011 Dhaka. 2013. District Statistics 2011: Bangladesh Bureau of Statistics (BBS).
- DMDP (Dhaka Metropolitan Development Plan,1995-2015: Vol-I, II, Planning definitions, Appendix 1, p.11. no.107
- Dong Wang, I. M.-B., Gregory Brown. 2013. Rethinking Accessibility in Planning of Urban Open Space Using an Integrative Theoretical Framework. Paper presented at the State of Australian Cities Conference.
- Gobster, P. H. 2001. Visions of nature: conflict and compatibility in urban park restoration. *Landscape and urban planning*, 56(1-2), 35-51.
- Hossain, 2005, J. 2012. Accessibility to Urban Open Spaces: How to measure it? UIS Research Seminar.
- Identification and Performance Evaluation of Christopher Alexander's PATTERN 60 in the context of Urban Dhaka to investigate Livability. 2013. Bangladesh University of Engineering And Technology.
- Islam, M., Mahmud, A., & Islam, S. M. D. 2015. Open space management of Dhaka city, Bangladesh: A case study on parks and playgrounds. *International Research Journal of Environment Sciences*, 4(12), 118-126.
- James, P., Tzoulas, K., Adams, M. D., Barber, A., Box, J., Breuste, J., & Handley, J. 2009. Towards an integrated understanding of green space in the European built environment. *Urban Forestry & Urban Greening*, 8(2):65-75.

- Khan, M. 2014. Study of Open Spaces in the Context of Dhaka City for Sustainable Use: A Syntactic Approach. *IACSIT International Journal of Engineering and Technology*, 6: 242-243.
- Koohsari, M. J., Mavoa, S., Villanueva, K., Sugiyama, T., Badland, H., Kaczynski, A. T., & Giles-Corti, B. 2015. Public open space, physical activity, urban design and public health: Concepts, methods and research agenda. *Health & place*. 33: 75-82.
- Maruani, T., & Amit-Cohen, I. 2007. Open space planning models: A review of approaches and methods. *Landscape and urban planning*, 81(1):1-13.
- Nasution, A. D., & Zahrah, W. 2014. Community perception on public open space and quality of life in Medan, Indonesia. *Procedia-Social and Behavioral Sciences*. 153: 585-594.
- Nilufar, F. (2000). Study of Responsive Public Open Spaces for Supporting Urban Life in Dhaka City. Asiatic Society of Bangladesh, Dhaka.
- Rashid, K. (2003), "Open space system of Dhaka City- need and possibilities of intervention", Proceedings of International Seminar 'Architecture Overcoming Constraints', Dept. of Architecture, BUET, June 11-13, p.190.
- Sharmin, S. T. F. and Tabassum, F. S 2013. Accessibility Analysis of Parks at Urban Neighborhood: The Case of Dhaka. *Asian Journal of Applied Science and Engineering*. 2:48-61.
- Suchana, S.B. 2013. Identification and performance evaluation of Christopher Alexander's pattern 60 in the context of Urban Dhaka to investigate livability. Master Of Architecture), Bangladesh University Of Engineering And Technology.
- The Daily star, 2004 "Dinngii promises to keep the lake waters clean", web edition, vol.4, No, 234. January 21
- Yang, H. J., Song, J., & Choi, M. J. 2016. Measuring the externality effects of commercial land use on residential land value: A case study of Seoul. *Sustainability*, 8(5), 432.
- Wang, D., Brown, G., & Mateo-Babiano, I. 2013. Beyond proximity: An integrated model of accessibility for public parks. *Asian Journal of Social Sciences & Humanities*, 2(3), 486-498.

A Planning Perspective on Fire Hazard Vulnerability of Shopping Centers in Dhaka City: A Case Study Base Approach

S. M. Nawshad Hossain^{*}
Saiful Islam^{**}

Abstract: Now-a-days, fire hazard has become a very common issue for Bangladesh, especially in urban areas. Shopping is an important and essential routine of urban life. Day by day the need for organized shopping centre is gaining importance in our society. The current trend in Dhaka is to accommodate various functions such as office, hotels, apartments etc. along with the shopping facilities within the same structure. These have increased the potential danger of fire hazard in these mixed uses, multi-storied and usually introvert building type. Fire at different shopping malls is a very common phenomenon nowadays. Shopping centers have large numbers of people passing through. So if any fire incidences occur in shopping centers it can causes human losses and damage properties. In recent few years, many fire incidents have taken place in different shopping centers at Dhaka City and other areas of the country. In this context, the present study tries to assess fire hazard vulnerability level of shopping centers. From the research findings it is observed that most of the case study shopping centers are highly vulnerable for fire hazard. There are several reasons behind the present situation. At the same time, these shopping centers are not well equipped with fire fighting tools to prevent fire hazard. At last, this study comes up with some recommendations. The implementation of these recommendations can help to reduce the risk of fire hazard vulnerability of these shopping centers, as well as other shopping centers of Dhaka City and the entire country.

Introduction

Fire is the rapid oxidation of a material in the exothermic chemical process of combustion, releasing heat, light and various reaction products (Sultana, 2017). From early of the “Stone Age”, fire was used for various purposes. At first the purposes were primitive but as the time passed by and development took place, the uses of fire changed. It became more complex and this change was taken as a positive outcome of development. More the civilization grew, more the development took place and the use of fire was exploited more. Along with its positive sides, fire is one of the most destructive forces of nature (Hossain, 2019). The number of fires hazard has increased across Bangladesh since 1997; with the year 2018 seeing a daily average of 53. Fire and Civil Defense statistics showed that around 250,000 fires occurred in the country between January 1, 1997 and December 31, 2018. These fires also caused an estimated financial loss of around Tk. 6,400 crore to the nation. At least 1,970 people were killed in around 200,000 fires across the country between 2004 and 2018, according to available fire service data. However, the highest number of casualties - 365 dead and 1,385 injured was recorded in 2011. In terms of financial losses, 2015 was the deadliest year as the country suffered a loss of an estimated Tk. 850 crore in 17,488 fires (<https://www.dhakatribune.com>).

^{*} Associate Professor, Dept. of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka-1342. E-mail: nawshad@juniv.edu

^{**} Freelance Researchers, Email: remonurp@gmail.com

Now-a-days, fire hazard has become a very common issue for Bangladesh, especially in urban areas. In recent few years, many fire incidents have taken place in urban areas. Most of the time, the victims of fire hazard are garments factories, industries, slums, chemical factories, high rise apartments, shopping centers and commercial buildings. And Dhaka, the capital of Bangladesh, has been the main victim of this type of occurrences. The possibility of a fire breaking, the potential fire area, the likelihood of a fire starting, the possible risks to life and the extent of damage increase with the size of a building; the increase in height can only make the situation worse (Tabassum, et al, 2014). Shopping is an important and essential routine of urban life. Day by day the need for organized shopping centre is gaining importance in our society. The current trend in Dhaka is to accommodate various functions such as office, hotels, apartments etc. along with the shopping facilities within the same structure. These have increased the potential danger of fire hazard in these mixed uses, multi-storied and usually introvert building type (<https://journals.abc.us.org>). Fire risk is considered as the major catastrophic risk for any shopping center. Moreover, the use of decorative materials that are highly combustible has become more popular in the modern shopping centers, which increase fire vulnerability. On the other hand, shopping centers of Bangladesh have failed to incorporate the factor of fire safety in overall design process of the shopping centers (Tabassum, et al, 2014). Shopping centers have large number of people passing through, especially at weekends and other times such as festive seasons. It is evident from different newspaper reports and research that maximum shopping centers have no proper fire safety management tools. So, if any fire incidents occur, it may cause human life losses and damage of properties. Different shopping centers of Dhaka City are also very much vulnerable for occurring fire accident. In the recent few years, different shopping centers of Dhaka City like Bashundhara City, Eastern Plaza, Motaleb Plaza, Multiplan Center, Sezan Point, Mazar Cooperative Market, Muktijoddha Super Market etc. faced problem of fire hazard (Islam, 2017). From various relevant research it is observed that till now much research have been conducted on the issue of fire hazard including fire risk assessment, hazard analysis and fire prevention measure for residential and industrial areas. But no mentionable in-depth study on fire hazard problem of shopping centers in Dhaka City has been carried out. In these circumstances, the present research attempts to assess the fire hazard vulnerability level of shopping centers of Dhaka City and finally recommends some guidelines to improve the present condition.

Objectives and Methodology of the Research

The present study aims to assess the fire hazard vulnerability level of the selected shopping centers by check list method. And finally it tries to come up with some guidelines from planning perspective to reduce fire hazard vulnerability of the shopping centers of Dhaka City.

For the purpose of this study, four shopping centers of Dhaka City, namely Bashundhara City Shopping Mall, Eastern Plaza, Motaleb Plaza and Muktijoddha Super Market were selected as case study. These shopping centers have already experience of fire hazard occurrence. Simple lottery method was adopted here as sampling technique to select the case study shopping centers.

For this research, information and data were collected both from “Primary” and “Secondary” sources. “Primary data” were collected through “Field Survey”, “Office Interview” and “Key Informant Interview”. To be familiar with the shopping centers, at first a “Reconnaissance Survey” was conducted. General information and firefighting equipment related information of these shopping centers were collected by empirical field level observation and “Office Interview” of the shop owners association of these shopping centers. “Key Informant Interview” was conducted to determine weight of different attributes to assess fire hazard vulnerability of shopping centers. The fire hazard vulnerability category of shopping centers was also developed by “Key Informant Interview”. “Secondary data” were collected by reviewing relevant literatures, i.e. statistical reports, newspapers, journal articles, seminar papers, published and unpublished thesis, books etc.

A Short Description of the Case Study Shopping Centers

Bashundhara City Shopping Mall: Bashundhara City is a shopping mall in Dhaka, It is the second largest shopping mall in Bangladesh opened for public on 6 August 2004. The mall is located in Panthapath, near Kawran Bazar. Bashundhara City is a 20 floor building complex covering an area of 191200 sqft comprising an 8 floor podium containing retail spaces, theme park, cinemas, fitness club, swimming pool and food court with a 20 storey Corporate Office of Bashundhara Group. The mall has space for 2,325 retail stores and cafeterias and has a large underground gymnasium, a multiplex cinema, a top-floor food court, an ice skating rink, and a theme park. The fully air-conditioned shopping mall with rooftop gardens is considered a modern symbol of the emerging city of Dhaka (https://en.wikipedia.org/wiki/Bashundhara_City).

Eastern Plaza: Eastern plaza is one of the most significant shopping centre in Dhaka City, which was started in 1992. It is one of the most beautiful mall in Dhaka. Eastern plaza is located at Hatirpool, near Bangla motor, panthapath, shahbag. This 10 storied shopping mall contains around 400 shops ensuring customers satisfaction (Islam, 2017).

Motalib Plaza: Motalib Plaza is a very significant shopping centre in Dhaka City, which is located in Hatirpool. This 17 storied shopping mall contains different types of shops. This is not a shopping centre, it also serves as residential and other commercial purposes. A huge number of populations travel these shopping centers for various purposes (Islam, 2017).

Muktijoddha Super Market: Muktijoddha Super Market is located at Mirpur section 1. It is the second oldest shopping center of Mirpur area. It was established in 1983. It is a 6 storied building. Ground to 3rd floor are using as shopping center and rest 2 floors are using as small scale sewing industries, good downs, commercial offices, a residential hotel etc. It is an air conditioned shopping centre of 44,000 sq. ft. (11,000 sq. ft. in each floor) having 600 shops. There is no garage or car parking facilities in this market (Hossain. 2019).



(a)



(b)



(c)



(d)

Fig. 1: Photograph of (a) Bashundhara City Shopping Mall, (b) Eastern Plaza, (c) Muktiyoddha Super Market, (d) Motalib Plaza

Source: Field Survey, 2019

Conceptual Issues regarding Fire Hazard Vulnerability Assessment of Shopping Centers

Fire: Martin and Kanury (1982) define that, fire is defined as a chemical process involving rapid oxidation of a combustible material producing heat and flame. Fire thus involves a chemical union between oxygen and fuel (or combustible material) that has a temperature raised to its ignition point by addition of heat. According to BFSCDD (2006), the main contributing factors of fires are –

- Natural factors: Fire caused by a disaster or a natural factor,
- Accidental factors: Fire caused by negligence, carelessness of human error.
- Incendiary factor: Fire caused by a deliberate or treacherous human act.

According to Nagar (2011), based on the various types of combustible materials, fire can be classified into four classes.

Table 1: Classification of Fire Hazard

| | |
|---------|-------------|
| Class A | Solid fire |
| Class B | Liquid fire |
| Class C | Gas fire |
| Class D | Metal fire |

Source: Nagar, 2011

Vulnerability: According to Nagar (2011), vulnerability is a concept which describes factors or constraints of an economic, social, physical or geographic nature, which reduce the ability to prepare for and cope with the impact of hazard.

Fire Hazard Vulnerability Assessment of Shopping Center by Checklist Method: According to Islam, et al. (2008), to assess fire hazard vulnerability level of a shopping center following five attributes are considered -

- Accessibility
- Transformer and Power Line
- Open Space between Two Buildings
- Emergency Exits
- Fire Alarm

The score calculation equation for assessment of fire hazard vulnerability level of a shopping center by Checklist Method is given below (Islam, et al., 2008):

Score for fire hazard vulnerability level of shopping centre = Weight for accessibility × (1 for no access or 0 for access) + Weight for open space between two buildings × (0 for not vulnerable or 1 for vulnerable for narrow space) + Weight for transformer and power line × (0 for not vulnerable or 1 for vulnerable considering power line or transformer) + Weight for emergency exit × (0 for having emergency exit or 1 for without emergency exit) + Weight for fire alarm × (0 for having fire alarm or 1 for without fire alarm).

The data of these attribute are collected through the field survey. By analyzing collected data, the value for non-vulnerability and vulnerability for each attribute is then determined. Weights for each attribute are determined with the expert opinion. More priority attribute gains more weight. The total score is then calculated for each shopping center using this weight and obtained value of different attributes through field survey. With help of the expert opinion, the vulnerability level of shopping centers can be classified into different categories based on the calculated score. Table 2 and 3 presents weight of different attributes and fire hazard vulnerability categories of shopping centers for this study based on the expert opinion respectively.

Table 2: Weight of Different Attributes for Fire Hazard Vulnerability Assessment of Shopping Centers

| Attribute | Weight (in a scale of 10) |
|-------------------------------------|---------------------------|
| Accessibility | 10 |
| Open space in between two buildings | 5 |
| Transformer and power line | 6 |
| Emergency exit | 10 |
| Fire alarm | 5 |

Source: Developed by the author with help of expert opinion, 2019

Table 3: Fire Hazard Vulnerability Category of Shopping Centers

| Vulnerability Category | Score |
|------------------------|---------|
| Low Vulnerability | 0 - 12 |
| Moderate Vulnerability | 13 - 24 |
| High Vulnerability | 25 - 36 |

Source: Developed by the author with help of expert opinion, 2019

Standard to Assign Value to Different Attributes for Assessing Fire Hazard Vulnerability of Shopping Centers: There is some legislation of different organizations, such as Bangladesh Fire Service and Civil Defense (BFSCD), RAJUK, National Building Authority etc. These legislations set following standard for different factors to assess fire hazard vulnerability of shopping centers in Bangladesh (Islam, 2017).

- **Accessibility:** Adjacent road width of the shopping center will be minimum 30 feet. If the adjacent road width of the shopping center is less than 30 feet, then it will gain less value.
- **Open space between two buildings:** 15 feet or above space is required between two buildings. To give the value for open space factor, distance between two apartments is to be judged. Considering this, if space between two buildings is little, the obtained value will be less for this factor.
- **Power lines and transformers:** High voltage electric line and transformer is to be laid at minimum 10 feet distance from the shopping center.
- **Emergency exit:** It should be 25 meters from any places of the shopping center. Minimum width of the fire stair (emergency stair) will be 1.5 meter. It should be connected with the ground floor and its lobby should be separated from the lobby of the lift.
- **Fire alarm:** Fire alarm is a device making a loud noise that gives warning of a fire. Sufficient number of alarm bell must be arranged in every floor.

Existing Condition of the Selected Shopping Centers in Terms of Fire Hazard Attributes

This section of the paper presents information regarding fire hazard vulnerability issue of the selected shopping centers.

1. Accessibility (Adjacent Road Width): Access way shall be provided for accessibility of site to firefighting appliances. To allow access of those appliances 30 feet wide road is required. From field survey, it is observed that the front side road of the Bashundhara Shopping Mall is sufficiently widened. But the access way of Eastern Plaza and Motalib Plaza is comparatively narrow and maximum time of the day it is occupied with heavy traffic. On the other hand, the access way of Muktijoddha Super Market is wide enough as per standard level, but often it is occupied with heavy traffic.



Fig. 2: Adjacent Road Width of (a) Bashundhara Shopping Mall, (b) Muktijoddha Super Market and (c) Motalib Plaza

Source: Field Survey, 2019

2. Open Space between Shopping Center and Adjacent Buildings: From field survey, it is observed that only Bashundhara City Shopping Mall has adequate space between adjacent buildings. Rest three shopping centers are very closely located with adjacent buildings.

3. Location of Transformer and Power Lines: From field survey it is observed that there are several numbers of transformers and electric poles around these shopping centers.

4. Emergency Exit: It provides a method of escape in the event of a fire or other emergency that makes the stairwells inside a building inaccessible. From field survey, it is observed that, in Bashundhara City Shopping Mall there are 3 emergency exits, in Eastern Plaza and Motalib Plaza there is one emergency exit, where as in Muktijoddha Super Market there are two emergency exits. The emergency gate of the Bashundhara City Shopping Mall is blockade by different materials and it is locked by the authority. In Motalib Plaza the emergency stairs is so narrow and sloppy. As a result during the fire hazard accident time, the people cannot move easily. In Eastern plaza, different types of waste are thrown in emergency exits and here Open stair will be a carrier of fire and smoke in Eastern plaza. In Muktijoddha Super Market the emergency exits are made of steel frame and always use as general stairway and these are not wide and strong enough to support during fire accident.



Fig. 3: (a) Locked emergency gate in Bashundhara City Shopping Mall, (b) Open stair will be a carrier of fire and smoke in Eastern Plaza, (c) Sloppy and narrow emergency stairs in Motalib Plaza and (d) Narrow and weak steel frame emergency stair in Muktijoddha Super Market

Source: Field Survey, 2019

5. Different Fire Fighting Tools, Signs and Symbols: Table 4 shows provision of different fire fighting tools of the case study shopping centers.

Table 4: Provision of fire fighting tools in the case study shopping centers

| Issues | Bashundhara City Shopping Mall | Eastern Plaza | Motalib Plaza | Muktijoddha Super Market |
|-------------------------------------|--------------------------------|---------------|---------------|--------------------------|
| No. of Fire Alarm | 6 in each floor | No | No | No |
| Smoke Detector | Yes | No | No | No |
| Heat Detector | Yes | No | No | No |
| No. of Fire Extinguisher | 119 | 14 | 32 | 40 |
| No. of Hose Reel | 96 | 10 | 14 | No |
| Stand Pipe | Yes | No | No | No |
| Provision of Fire Signs and Symbols | Yes | Yes | No | No |

Source: Field Survey, 2019 and Office Interview of Shop Owners Association of the Shopping Centers, 2019

Fire Hazard Vulnerability Assessment of the Case Study Shopping Centers

To assess the fire hazard vulnerability level of a shopping center, five attributes are considered in check list method. The weights of these attributes have been determined with help of fire expert opinion (Table 2). The data on these attributes have been collected through the field survey. By analyzing the collected data and compare it with the standard for fire safety set by different organizations, the value for non-vulnerability and vulnerability for each attribute have been determined. Table 5 shows obtained value of different attributes of the four case study shopping centers.

Table 5: Obtained Value of Different Attributes for the Selected Shopping Centers

| Attribute | Obtained Value | | | |
|-------------------------------------|--------------------------------|---------------|---------------|--------------------------|
| | Bashundhara City Shopping Mall | Eastern Plaza | Motalib Plaza | Muktijoddha Super Market |
| Accessibility | 0 | 1 | 1 | 0 |
| Open space in between two buildings | 0 | 1 | 1 | 1 |
| Transformer and power line | 1 | 1 | 1 | 1 |
| Emergency exit | 0 | 0 | 0 | 0 |
| Fire alarm | 0 | 1 | 1 | 1 |

Source: Developed by the author with help of field survey, 2019

Now the weight and obtained value of different attributes are incorporated into the following equation of fire hazard vulnerability assessment and final score for each market are determined. Compare the calculated value with the standard value set by expert opinion (Table 3), the fire hazard vulnerability category of each shopping center is then determined.

Score for fire hazard vulnerability level of shopping centre = Weight for accessibility \times (1 for no access or 0 for access) + Weight for open space between two buildings \times (0 for not vulnerable or 1 for vulnerable for narrow space) + Weight for transformer and power line \times (0 for not vulnerable or 1 for vulnerable considering power line or transformer) + Weight for emergency exit \times (0 for having emergency exit or 1 for without emergency exit) + Weight for fire alarm \times (0 for having fire alarm or 1 for without fire alarm).

Table 6: Fire Hazard Vulnerability Level of the Case Study Shopping Centers

| Shopping Center | Fire Hazard Vulnerability Assessment Score | Level of Fire Hazard Vulnerability |
|--------------------------------|---|------------------------------------|
| Bashundhara City Shopping Mall | $10 \times 0 + 5 \times 0 + 6 \times 1 + 10 \times 0 + 5 \times 0 = 6$ | Low |
| Eastern Plaza | $10 \times 1 + 5 \times 1 + 6 \times 1 + 10 \times 0 + 5 \times 1 = 26$ | High |
| Motalib Plaza | $10 \times 1 + 5 \times 1 + 6 \times 1 + 10 \times 0 + 5 \times 1 = 26$ | High |
| Muktijoddha Super Market | $10 \times 0 + 5 \times 1 + 6 \times 1 + 10 \times 0 + 5 \times 1 = 16$ | Moderate |

Source: Developed by the author, 2019

From Table 6, it is observed that fire hazard vulnerability score of Bashundhara City Shopping Mall is 6, whereas it is 26 for Eastern Plaza and Motalib Plaza. The value is 16 for Muktijoddha Super Market. That means Bashundhara City Shopping Mall is less vulnerable and Muktijoddha Super Market is moderately vulnerable for fire hazard. On the contrary, Eastern Plaza and Motalib Plaza are highly vulnerable for fire hazard.

Major Findings of the Study

From the empirical field level observation and analysis of the collected data, following major findings are observed:

- Though all the four shopping centers have previous experience of fire hazard, but till now 2 (Eastern Plaza and Motalib Plaza) are highly vulnerable and 1 (Muktijoddha Super Market) is moderately vulnerable to fire hazard. Bashundhara City Shopping Mall is less vulnerable in this regard.
- Except Bashundhara City Shopping Mall, none of other three shopping centers are equipped with fire fighting equipments for fire hazard mitigation. None of them have fire alarm, hose reel, heat and smoke detector, wet and dry riser, water sprinkler etc. Most of the shopping centers just have fire extinguishers. But the number of fire extinguisher is not sufficient enough according to stand level for fire safety of shopping centers. At the same time, 50% of these shopping centers have fire sign and symbol.
- Though all case study shopping centers have emergency exit, but either the emergency stairs are lock for all time or very narrow in width. That may hamper the proper function of emergency exits during emergency time.
- Except Bashundhara City Shopping Mall. Other three shopping centers are closely surrounded by other buildings. So, if any fire hazard occurs in any of these shopping centers, then there will be a good chance to spread the fire to the adjacent buildings.
- Electric transformers, electric poles and high voltage electric lines are located very close to all the shopping centers, which makes the shopping centers more vulnerable for fire hazard risk too. If any fire hazard occurs in any of these shopping centers, then transformers, high voltage lines and electric poles may be explored by fire due to close location to the shopping centers, which may cause disastrous situation not only to the shopping centers but also to the surrounding locality.
- The buildings of all the four selected shopping centers are of mixed use nature. Besides use as shopping centers, some floors of these buildings are also used as commercial spaces, good down, small scale sewing factories, garments industries etc. From many real experiences in Bangladesh it is evident that serious fire accident occurred in good downs, sewing factories, garments etc. due to several reasons. So, the mixed use nature of these buildings makes all four shopping centers more or less vulnerable to fire risk.
- Proper fire fighting drill can be helpful to safe life and resources during the time of fire hazard. But fire fighting drill is not properly practiced in these shopping centers.

The above scenario does not only belong to these four selected shopping centers; this scenario is common for most of the shopping centers of Dhaka City and other areas of the country as well.

Planning Perspective to Reduce Fire Hazard Vulnerability of the Selected Shopping Centers

From the findings of the study it can be easily stated that the fire safety management of the selected shopping centers is very poor. This scenario is common all over the country. From this study it becomes clear that there are some reasons for the high level of fire hazard vulnerability of shopping centers in the country. So it is the right time to take necessary initiatives to improve the present condition of fire hazard vulnerability of shopping centers. But no policy recommendation will be successful in this case until the concerned authority will not participate for the improvement of the situation. The study suggests following guidelines from planning perspective for reducing the problems of fire hazard vulnerability of the selected shopping centers, as well as other shopping centers of the country:

- **Enforcement of Building Code:** Excellent provisions have been made for fire protection and safer buildings under the National Building Code 2012. The code is a system of risk management designed to provide socially acceptable level of risk for the public. Since it is a system, it is possible to change components within the system and maintain the overall level of safety (Benjamin Clarke Associates, 1984). But the code is not being followed by the occupants of property and developers and also is not being enforced properly by the enforcing authority. The proper enforcement of this code may reduce the possible risk of fire hazard. So, enforcement of building code should be ensured.
- **Measures related to Open Space between Two Buildings:** From the field survey, it is evident that most of the case study shopping centers have sufficient space between adjacent buildings. This is because of violating building code and approved plan of RAJUK. No monitoring by RAJUK is also accountable in this regard. If possible RAJUK should have to take corrective measures (demolish the unauthorized portion of the buildings) as per the approved plan of the shopping centers to create open space between adjacent building in order to reduce the fire hazard risk.
- **Measures related to Emergency Exit:** According to BNBC 2012 and Dhaka Mohanagar Imarat Nirman Bidhimala 2008, each shopping center should have sufficient provision of emergency exits. But from the field survey, it is evident that the existing emergency exits of the selected shopping centers are not satisfactory at all. If possible, these shopping centers should have to develop more emergency exits to ensure safe escape routes during the time of fire hazard.
- **Measures related to Fire Fighting Equipments:** From field survey and office interview of shop owners association of the shopping centers, it is evident that none of these shopping centers are well equipped with fire fighting tools. To reduce fire hazard vulnerability level, first of all these shopping centers should have to install sufficient number of fire alarms. Though most of these shopping centers only have fire extinguishers as fire fighting tool, but these are not sufficient enough. So, arrangement of sufficient fire extinguishers should be ensured. At the same, arrangement of other fire fighting equipments like smoke and heat detectors, hose reels, water sprinklers, wet and dry risers etc. should be

ensured. Moreover, there should be sufficient provision of fire signs and symbols in the markets.

- **Measures related to Location of Transformers and Electric Poles:** The minimum distance between any electric pole or transformer and a building from any side should be 10 ft. But from field survey, it is observed that a lot of transformers and electric poles are located within in 10 ft. distance from the selected shopping centers. To reduce the fire vulnerability of these shopping centers, transformers and electric poles need to be relocated on an emergency basis. DESCO is the concern authority to supply electricity and maintain electricity lines, transformers, electric poles etc. in this locality. So, DESCO has to take immediate steps to relocate these transformers and electric poles.
- **Arrangement of Regular Fire Drill:** According to BNBC 2012, each shopping center should have to arrange at least two fire fighting drill annually. Regular arrangement of fire drill may help to reduce loss of life and property at the time of fire accident and any other accident, too. So, regular fire drill should have to be arranged in these shopping centers. The management authority of these shopping centers has to arrange at least two fire drills annually. Bangladesh Fire Service and Civil Defense authority should have to provide necessary support to the concerned authorities of the shopping centers in this regard.
- **Appointment of Fire Safety Manager and Other Fire Safety Personnel:** All the selected shopping centers need to appoint a Fire Safety Manager along with other Fire Safety Personnel. A competent person should be appointed as Fire Safety Manager. This person should be given sufficient stated authority, powers of sanction and resources to take responsibility for the day to day safety management of the shopping centre and to ensure that essential repairs or maintenance are carried out. The role of the Fire Safety Manager may be combined with other health and safety or security functions. The Fire Safety Manager should appoint a Duty Safety Officer, the key decision maker in responding to a fire incident. A Duty Safety Officer should be present at all times whenever the centre is occupied. In the case of a fire incident, the Duty Safety Officer should hand over control to the fire service on their arrival but should be available to provide advice and other assistance on request.
- **Regular Monitoring by BFSCD:** Bangladesh Fire Service and Civil Defense authority should ensure regular inspection of shopping centers of the city to understand their fire safety management capacity. BFSCD may provide necessary advices and guidelines to increase fire safety management capacity of the shopping centers. This may help to reduce fire hazard vulnerability level of the shopping centers as well.

Conclusion

Shopping centre is an important place for people. At present a lot of shopping centers are running all over the city. Among them a big numbers of shopping centers have a doubtful facility to fight with fire. Ignoring fire risk, most shopping malls and markets in the capital have been running without mandatory safety measures for years, posing a serious

threat, according to Fire Service and Civil Defense (<https://www.thedailystar.net>). Most of the shopping centers that are selected as sample shopping centers for this study are facing same problems like other shopping centers of the city. More or less these shopping centers are vulnerable to fire hazard. This study has addressed several reasons behind the vulnerability. Now it is very urgent to make our people aware about fire hazard. To meet the current challenge, it is the right time that government officials and all the concerned authorities take appropriate measures to ensure adequate safety for people at shopping centers. It is the responsibility of the market management authorities to ensure safe and secured shopping malls for their market personnel as well as their valued customers. The necessary actions as recommended in this study can be taken on an emergency basis to reduce the fire hazard vulnerability of the selected shopping centers. These recommendations can also be applied to other shopping centers of Dhaka City and all over the country. At the same time, the technical capacity and manpower of the Fire Service and Civil Defense should be improved that they may play effective role at the time of fire hazard to reduce the damage effects.

References

- BFSCDD. 2006. Annual Training guide (Fire Extinguish), Bangladesh Fire Service and Civil Defense Department, Dhaka.
- Hossain, S. M. N. 2019. *Fire Hazard Vulnerability Assessment of Shopping Centers in Mirpur Section - 1 of Dhaka City: A Case Study Based Approach*, an unpublished Research Report, Jahangirnagar University, Savar, Dhaka.
- https://en.wikipedia.org/wiki/Bashundhara_City, Retrieved on February 8, 2020.
- <https://journals.abc.us.org/index.php/ajase/article/download/76-88/364>, Retrieved on May 8, 2019.
- <https://www.dhakatribune.com>, Retrieved on April 25, 2019.
- <https://www.thedailystar.net/city/news/1300-city-markets-malls-fire-risk-1722793>, Retrieved on May 14, 2019.
- Islam, Raza and Islam, 2008. *Analyzing Vulnerability of a Community to Fire hazard: A Case Study of Ward 72*, Retrieved from <http://www.scribd.com/doc/6143504/Vulnerability-analysis-of-a-community-to-Fire-Hazard>, Retrieved on May 18, 2019.
- Islam, S. 2017. *Fire Safety Management of Shopping Center: A Case Study of Some Selected Shopping Centers of Dhaka South City Corporation*, an unpublished MURP Thesis, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka.
- Martin, T., and Kanury. 1982. Axioms of fire risk, *Fire Technology*, February, pp 1-2 .
- Nagar, N. A. 2011. *Fire Hazard Vulnerability Analysis of Old Dhaka: A Case Study on Ward No-69*, an unpublished BURP Thesis, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka. Jahangirnagar University, Savar, Dhaka.
- Sultana, S. 2017. *Addressing the Fire Hazard Problem in Old Dhaka: A Case Study of Ward no. 29 of DSCC*, an unpublished BURP Thesis, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka.
- Tabassum, S., Ahmed. S., and Romeo, M. T. 2014. *An Investigation on Fire Safety of Airconditioned Shopping Centers at Dhaka City*. *Asian Journal of Applied Science and Engineering*, Volume 3, No 2 (2014).

Possibilities of Creating Pocket Parks at High Density Residential Neighborhoods in Urban Area: Dhaka South City Corporation (DSCC) as a Case Study

Md. Ruhel Uddin^{*}
Ummeh Saika^{**}
Mohammad Ismail Hossain^{***}

Abstract: With rapid population growth in Bangladesh and increased development, urban green areas are declining as quality parks and recreational spaces for inner-city residents, especially in Dhaka, are considered a major threat. Urban neighborhoods are forced to address increased densities and a small supply of open land by offering green spaces to residents through development programs and future solutions. The significance of pocket parks, in particular, is unclear. Urban pocket parks serve as an explanation for providing green spaces in such densely populated areas. The aim of the research, which was conducted in a megacity residential informal neighborhood in ward-19, Dhaka South City Corporation, is to understand the possibility of developing pocket parks within the community involvement in neglected and open areas. The findings of questionnaires and field observations, as well as Google Earth imagery and ArcGIS tools used to prepare maps and design the areas, show that turning low traffic areas and vacant open space into pocket parks is an opportunity, and it is well tended by the local people in the area. Spite of the fact that residents are keen to get involved and develop their environment, the main challenges are developing privately owned parcels and creating a sustainable concept as an effective tool in sustainable urban pocket park design.

Keywords: converting, development, design, pocket park, sustainable

Introduction

Urban parks have long been regarded as important contributions to the physical and visual appearance of communities, as well as offering social, economic, and environmental benefits to the city (Walker, 2004). The existence of public open space as a means of group activities will bring the modern city to life, thereby enhancing society's and the urban environment's quality of life (Shirleyana, 2013). The small amount of accessible green land in urban areas makes it extremely impossible to provide affordable park and leisure space for inner-city residents. However, the world's population is growing, towns are expanding, and property values are that. Expansion of urban residential and industrial uses, as well as community expansion, has resulted in the lack of green areas and generated pressure against creating new open green spaces in cities (Alvarsson et al., 2010). The latest paradox is that urban green spaces are under pressure as a result of migration to suburbs, unplanned infrastructure expansion, and a lack of adequate oversight and stakeholder control (Baur and Tynon, 2010). To satisfy these growing demands, park and recreation departments will play an important role in

^{*} Research Student, Department of Geography and Environment, Faculty of Social Sciences, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh, Email: ruheluddin3@gmail.com

^{**} Associate Professor, Department of Geography and Environment, Faculty of Social Sciences, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh, E-mail address: usaikau@gmail.com, usaikau@juniv.edu

^{***} Ph.D Researcher, Department of Tourism Science, Tokyo Metropolitan University, Tokyo, Japan, Email: ihossian1634@gmail.com

transforming neglected and vacant open spaces into what are known as mini or pocket parks (Jarzen, 2014). These urban green spaces are important for future generations because they provide ecosystem resources, outdoor entertainment, park tourism, and shield cities from the effects of climate change (Peters, et al., 2010). These remarkable parks are often built from vacant lots, rooftops, and other neglected and unused areas. (Kong et al., 2010). Pocket parks were first used in the 1960s as a small-scale urban green space that provides a healthy and positive environment for residents of the local population. A pocket park is a small outdoor field, typically less than a quarter of an acre in size with just a few house lots in size or smaller, most commonly situated in an urban area surrounded by commercial buildings or houses on small lots as a crucial part of the urban green system, such as boulevards, green lanes, green sidewalks, urban woods, roofs, and private gardens with few areas for people to go. According to the World Health Organization (WHO, 1948), Human wellbeing is affected by physical exercise and emotional well-being. Dhaka, Bangladesh's capital and most populous city, is now a part of the world's "mega-city" family (Hossain, 2006). The overall city climate is declining day by day as a result of rapid and unplanned urbanization, commercial expansion, and demographic pressure (Ummeh and Kikuchi, 2017). Owing to overpopulation and a high rate of migration from rural to urban areas, the green cover area has been turned into a grey area (Schipperijn, 2010). Furthermore, industrialization, economic growth, and land-use transition are major contributors to the dramatic decrease of current green cover over the last half-century. (Ansari, 2008). Since the government has no long-term plans to maintain the city green other than the development of a few parks and roadside plantations as part of the city beautification scheme, the process of reducing green capital was aided (Swapan et al., 2017).

However, study is still limited, and landscape architects, city planners, and builders do not have a complete understanding of how various features will serve the desired activities. A study by Shirley (2013), It was examined how nine small public urban green spaces (pocket parks) were used. The research shows that the spaces were mostly used to improve connectivity to services. This ensures economic stability in the usage of such facilities because they are more cost-effective because they accommodate a larger number of individuals (Triman, 2012). In urban settings, open space has a variety of benefits, including formal and informal games and recreation, the preservation of native environments, the arrangement of green space, and even urban stormwater control (LeFlore, 2012; Ming, 2014). Along these lines, if the strength of a city and its kin are both regarded as important, green space must be a central consideration in urban planning. Another, wider perspective on parks has recently arisen. This current study focus on how policymakers, researchers, and the general public may begin to recognize parks as important promoters of larger urban strategy destinations, such as employment options, community engagement, public health, and building capacity (Ahmed, et al., 2013).

The primary objective of this research is to determine the need, extent of accessibility, and application of pocket parks in the megacity of Dhaka, Bangladesh. Previous research suggested that, based on an analysis of different studies comparing various types of green pocket parks, location knowledge about the pocket park, to determine how to apply pocket parks in the study area to get beneficial metrics was more effectively linked to human health than community area closeness ones. We developed the following research goals based on previously known problems:

To achieve the research objective, two approaches are pointed out:

- To understand the necessities and significant of urban pocket parks;
- To identify the unused space using with GIS (Geographical Information System), GPS (Global Positioning System) and Google Earth Image in Dhaka city, especially Dhaka South City Corporation (Ward no-19);
- To understand the local knowledge and beneficial community of parks with their space characteristics.

Material and Methods

Study Area

Dhaka, Bangladesh's capital and largest city, is established in the flat deltaic area of the three main international rivers, the Ganges, the Brahmaputra, and the Meghna, each of which has a distinct primary in the national and regional hierarchy. These three major rivers' distributaries surround the region. Geographically, Dhaka is located in Bangladesh on the northern side of the Buriganga River. The Balu river boundaries it in the east, and the Turag river borders it in the west and north. Dhaka's growing development and primacy can be attributed in part to its geographical position. Because of its central location, it has easy access to all major towns and cities in Bangladesh by rail, road, water, and air (Islam, 2001).

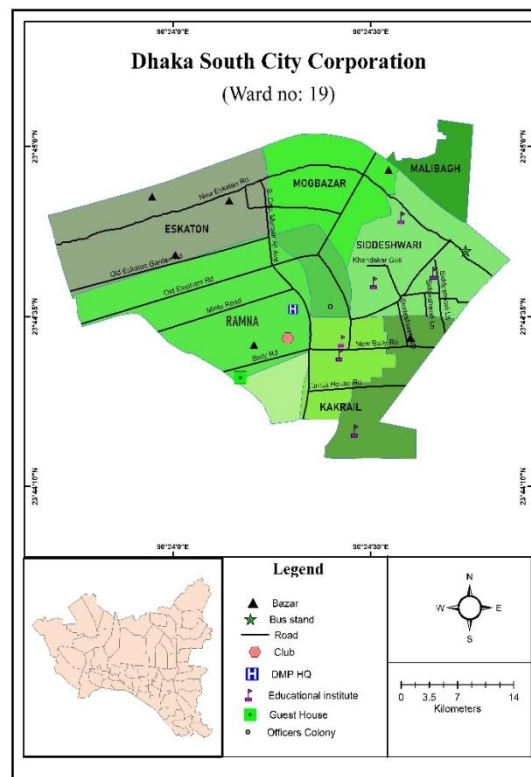


Figure 1: Study area, Ward no-19, Dhaka South City Corporation

Dhaka, a 590-square-mile megacity, currently has a population of around 18.89 million people and is rising at a 6% annual rate (BBS, 2015). Dhaka is a diverse city in central Bangladesh, situated along the Buriganga River. It is not only the capital, but also the largest city in the world. In 2016, the Greater Dhaka Area had a population of 18.237 million people. Dhaka is situated in central Bangladesh at 23°42'N 90°22'E, on the Buriganga River's eastern side. The city has a total area of 306.38 square kilometers and is located on the lower reaches of the Ganges Delta (118.29 sq. mi). It is made up of two city corporations: Dhaka North City Corporation (DNCC) and Dhaka South City Corporation (DSCC). DNCC have 36 wards and DSCC have 57 wards. Ward No. 19 is an important area of the Dhaka South City Corporation. It is located under Ramna thana. It is situated between the latitudes of 23° 44' 10" and 23° 44' 50" N, and the longitudes of 90° 23' 30" and 90° 25' 00" E.

Methods

Urban green spaces are an important component of urban life that, due to their nature and multifunctionality, may play a model role in enhancing the vitality and quality of urban life (Yin, et al., 2010). Urban parks are used not only as active recreational and leisure facilities for its residents, but also as a key catalyst for urban growth and enhancement (Tabassum, 2018). To evaluate the requirements and accessibility of pocket parks, this analysis used a multi-approach technique. Topographic, featured, and reference information Google Earth imagery and mathematical data were used to construct spatial distribution charts. The National Population and Housing Censuses were merged to provide secondary statistical data (NPHC) 2011 data as well as socio-spatial, demographic, and public green space data from the research areas. We obtained population and housing census data from the Bangladesh Bureau of Statistics (BBS) as well as a geo-referenced master map of Dhaka City from Google Earth Pro, which includes administrative units as well as man-made features. We used Google Earth Pro powered by Google Satellite to create raster maps of the study areas and park distribution (www.maps.google.com). Google Earth Pro was used to process and extract a time-distance grid network map. For place and park characteristics, we gathered historical Thana (subdistrict) maps from Banglapedia, an open data source website for Bangladesh that is the National Encyclopedia of Bangladesh (www.en.banglapedia.org).

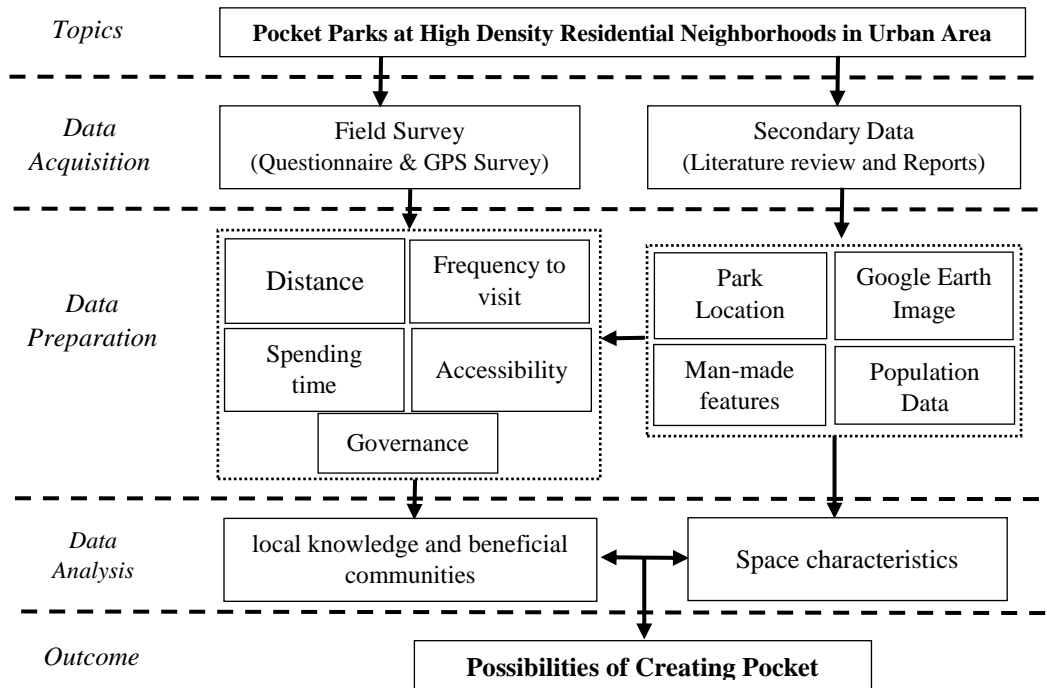


Figure 2: General Methodological flowchart: data acquisition, Data preparation, Analysis and outcome

The time-distance weighted methodology depicts mobility by measuring the time or distance taken for city dwellers to travel to pocket parks or underutilized areas. It is usually aimed at determining the position of the areas, the local influence, and the administration level of urban open space as a pocket park. The distance tool was used in the research to examine the closest parks by walking from separate circled residential areas in Dhaka's central urban zones. The approach identifies the open field of the research area by using raster data converted into vector data by the ArcGIS 10.0 Software Package and Google Earth software. To evaluate the correct location, we used the postal code as well as the road name, and a field survey was performed between April and July of 2019. The importance of urban green pocket park accessibility, which is a crucial topic related to urban natural space, is described as the relative or severe degree of difficulty that people experience when using a particular transportation device to resolve space resistance from urban open parks from a given area. A questionnaire survey of park visitors and field observations were conducted as primary data sources for the interpretation of the necessity and application of the study area's pocket park (Figure2). Snowball sampling techniques were used on park users, with a sample size of 96.

Table 1. The demographic characteristics of word 19 dwellers

| <i>Demographics</i> | | <i>Percentage (%)</i> |
|----------------------|----------------------------|-----------------------|
| Gender | Male | 65.5 |
| | Female | 34.5 |
| Age Group | ~10 Years | 8.1 |
| | From 10-15 | 9.5 |
| | From 16-45 | 27.6 |
| | From 45-60 | 39.4 |
| | 60~ | 15.4 |
| Education | Illiterate | 5.4 |
| | Read and Write | 8.8 |
| | Intermediate | 19.3 |
| | High School | 26.9 |
| | College Graduate Or Higher | 39.6 |
| Occupation situation | Unemployment | 10.4 |
| | Government job | 56.5 |
| | Private job | 21.7 |
| | Others | 11.4 |

Results

Demographic trends associated with the use of Pocket Parks in the neighborhood

The level of usage of pocket parks is associated with age (see table 1); older respondents visit the pocket parks more often than younger respondents. Furthermore, respondents with less than 10 years of education are more likely than those with more than 45 years of education to visit pocket parks at least once a week. The 45-60 year old respondents are more than twice as likely as the 10-15 year olds to visit pocket parks for the usage 'rest and restitution.' Furthermore, women are less likely than men to attend pocket parks for 'walk/physical exercise,' while the same trend is found for 'get together'. There is a trend in that the older people are, the less likely they are to use pocket parks for 'walking/physical exercise.' Nationality, civil status, and profession do not tend to predict pocket park use. There are various trends in the relationship between the purpose for usage and the sense of use of the pocket parks. The shorter distances traveled to the pocket parks are compared to 'coming from home and going home' or 'coming from A and going to,' while the longer distances are referred to 'en route.' However, as seen in table 1, quite a few respondents have driven 'more than 1km' (13.8%) or 'more' (10.3%) while 'coming from A and going home'.

Table 2. Using pattern of Pocket Parks in ward-19

| <i>Using pattern of Pocket Parks</i> | | <i>Percentage (%)</i> |
|---|-------------------------|-----------------------|
| Why did you come here?/ Purpose to visit the park | Get together | 16.3 |
| | Walk/ Physical exercise | 34.2 |
| | Rest & Refreshment | 28.1 |
| | Play | 13.8 |
| | Others | 7.6 |
| How far have you travelled to get here? | Less than 1km | 43.4 |
| | At 1 km | 32.5 |
| | More than 1km | 13.8 |
| | More | 10.3 |
| Frequency to visit the park | Daily | 65.6 |
| | Weekly | 26.2 |
| | Monthly | 8.2 |
| How much time to spend here? | Around 15min | 33.3 |
| | More than 30min | 41.2 |
| | Around 1 hour | 16.4 |
| | More than 1 hour | 9.1 |
| Need management and policy for Pocket Park | Yes | 74.63 |
| | No | 25.37 |

Pocket Parks' general usage pattern

Table 1 shows that pocket parks are mainly used for 'walking/physical fitness' and 'rest and restitution.' The operation 'other reasons' is for (e.g. smoking, photography, talking on the phone). More than half of those interviewed choose to stroll to the pocket parks. The majority of respondents visit the pocket parks in the morning, but the afternoon is also favoured, and their visits continue for more than 30 minutes. The amount of time people spend in pocket parks varies depending on their hobbies. In terms of time spent in the pocket parks, 34.2 percent of those who 'walk/physical exercise' spend more than 30 minutes, while 28.1 percent of those who use the pocket parks for 'rest and restitution' spend less than 15 minutes (see figure 4).

| | |
|---|--|
| | |
| <p>Figure 3: Distance from origin to park</p> | <p>Figure 4: Purpose to visit the park</p> |
| | |
| <p>Figure 5: Spending time and activities inside the park</p> | <p>Figure 6: Management and policy for Pocket Park</p> |

The findings suggest that frequency of use is related to distance traveled (see table 2 and figure 3). Those who commute less than 1km are five times more likely than those who travel more than 1km to visit a pocket park once a week. The same trend can be found for level of use and living distance from pocket parks. Respondents who live less than 1km away are twice as likely as those who live farther away to frequent the pocket parks at least once a week. However, more than half of the respondents live less than one kilometer from the pocket parks.

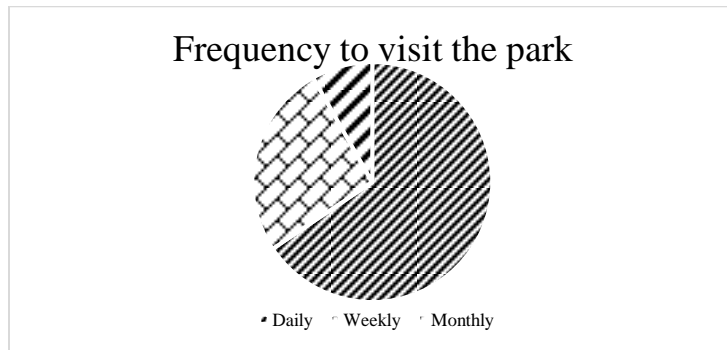


Figure 7: Frequency to visit the park

The distance of pocket parks in relation to their frequency of use

According to previous research on other parks (Ummeh and Kikuchi, 2017), shorter distances is associated with increased frequency of use. This trend was found for both the distance traveled to the pocket parks and the distance resided from the pocket parks. However, many consumers traveled more than 1km and stayed farther out, which may be clarified by the sense of usage ('en route,' 'coming from home,' or 'going home'). This may also mean that providing pocket parks near to work or other city attractions is useful for people who travel about the city on a regular basis.

The users and use of the urban pocket parks

As seen in the results section, the respondents represent the general population of Dhaka city, especially Ward-19, implying that pocket parks are used by a diverse user community that includes men and women of all ages and educational levels (see table 1). However, as compared to the general population of the region, the proportion of well-educated respondents included in this analysis was higher, as has been seen in previous research where a higher education level is significantly linked to greater usage of urban green spaces (Schipperijn et al., 2010). Previous study has found that the age group 36 – 50 years uses urban green spaces the most (Yilmaz et al., 2007), which supports the high proportion of respondents aged 30 – 49 years (see figure 7). During data collection, it was discovered that men use pocket parks rather than women.

Many respondents appear to stroll or exercise to the pocket parks, which may suggest the importance of pocket parks in comparison to where people drive about in the area (e.g. work, home other business in the city). As predicted, a significant number of users visited the pocket parks for 'walk/physical exercise' and 'get together,' which is consistent with previous studies on UGS use. (Nilsson et al., 2011). The fact that 'walk/physical exercise' was a favoured mode of usage backs up earlier observations by Nordh et al. on the chances of regeneration of pocket parks (2010). Furthermore, the vast number of people who use pocket parks for the purpose of 'walking' shows the significance of pocket parks in terms of social contact and serious psychological refreshment. Other studies have suggested that nature may encourage social interaction and networking (e.g., Maas et al., 2009;), but the theory has received little attention in the literature, especially in relation to pocket parks (Lygum et al., 2013).

Discussion

“Parks and green spaces inject life into our busy towns and villages, supplying neighbourhoods with valuable spaces to gather, workout, and play,” said Grey Clark. The funding would help urban areas with few green spaces, fulfilling the government's manifesto promise to build pocket parks throughout the world (Ansari, 2008). These winning bids all have a deep community focus at the heart of their designs, and their planners have come up with extremely innovative proposals to turn underutilized urban areas into the green lungs of their cities, which can be enjoyed for years to come.” The research findings presented here may support in the creation of guidelines for the establishment of new pocket parks in Dhaka. It should be noted that the scale of the biologically active region has a significant effect on the rise in the number of users. However, with the prospect of incorporating important green spaces into the city center,

it is reasonable and legitimate that they can cover as much of the available area as possible.

Factors influencing pocket park use

Age, education, and ethnicity are all considerations. Pocket parks are used more often by older respondents than by younger respondents. Furthermore, older people tend to frequent pocket parks for 'physical exercise' rather than social reasons. There is no clear reason for this, while younger people may use pocket parks mostly for social events. Women are less likely than men to attend pocket parks for "psychological restoration and emotional well-being," which may be due to time constraints. First and foremost, women often believe that they are "too distracted" to go outside (Hitchings, 2010). Second, women have higher stress levels than men (Stigsdotter et al., 2010), and younger women with children in particular have high stress levels (Stigsdotter & Grahn, 2011), so they do not have time to visit pocket parks for 'psychological restoration and emotional well-being.' According to Yilmaz et al. (2007), women often visit parks with their children on weekends and during vacations, so their use could be more socially associated, which may explain the higher percentage of women who use pocket parks for 'psychological regeneration and mental well-being.'

Overall, we see that pocket parks have the potential to increase green space in the study city. It is critical to raise public and policymaker consciousness of the various reimbursements for green spaces and their vital role in spreading them widely. Furthermore, sustainable improvements and urban green spaces contribute significantly to the image of urban environments as well as the enhancement of the quality of life for those who live there (Mitchell and Popham, 2008). Every day, a significant number of people visit the park for physical fitness and leisure. However, isolation is the most important aspect affecting park users. Distance is also a major factor in the park's male-female ratio. Any tourists are familiar with the pocket park. However, most people are ignorant of the pocket park. They want to use their money to build a pocket park. Pocket parks can be designed both publicly and privately. In this case, the government should make policy, and non-governmental organizations (NGOs) should create pocket parks with the consent of relevant authorities while they focus on urban greenery, community beautification, poverty, and natural stormwater drainage systems.

Designers must frequently perform a delicate balancing act when planning pocket parks so that both parties can share the facility in respectful coexistence. There are no standard designs for pocket parks; each one is unique based on the size and use of the space. But, since space is limited and user desires are varied and change during the day, clashes between various groups will occur. Thus, park and recreation departments can help to realize the community's vision for parks by aiding in the formulation of an action plan that begins with small-scale, doable changes that serve green spaces and the residents who use them straight away (see figure 6).

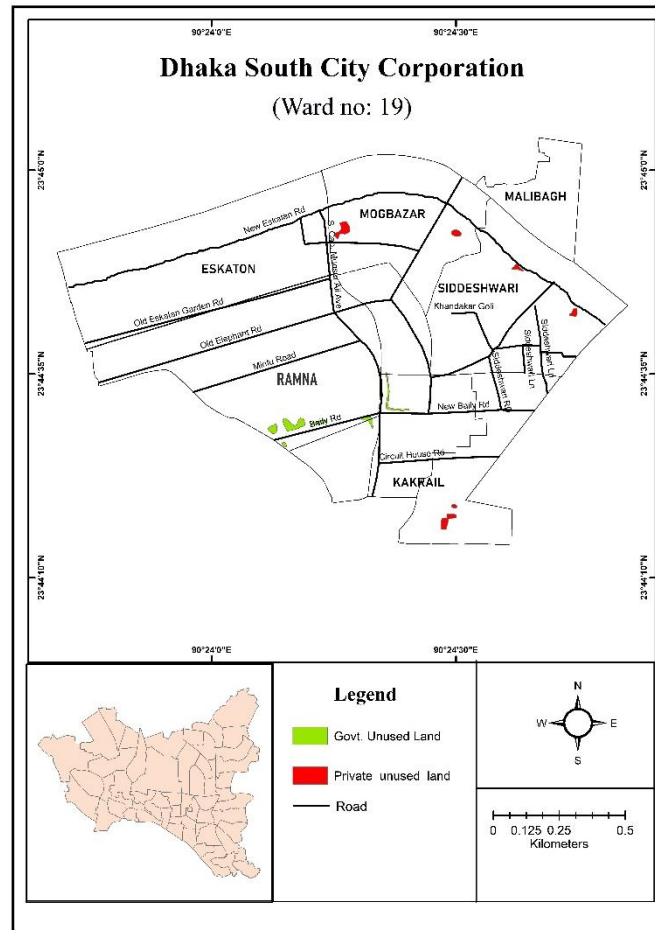


Figure 8: Identifying Unused Land On study area

More specifically, park and recreation organizations should assist with the construction of parks to maximize neighborhood value. Since miniparks cannot offer all of the advantages of large parks, park and recreation authorities can assist in determining what trade-offs will be required. Pocket park construction, like any modern park or leisure innovation, is fraught with difficulties (Hossain, 2006). Some of the more common concerns encountered in the construction of pocket parks are as follows: (1) monetary function; (2) availability of vacant lands or plots; (3) lack of response from interested authorities and users; and (4) lack of community involvement.

In this regard, the pocket park will help to alleviate these issues by including physical activity, fitness services, and outdoor entertainment. Environmental contamination is putting a burden on the urban population and poses a significant danger to city dwellers (Islam, 2002). Nearly one million Bangladeshis, the bulk of whom are poor, are at risk of air and noise pollution. In this respect, the pocket park may be a means of mitigation for the health threats posed by women and children. However, traffic congestion and poverty in Dhaka are significant impediments to women and children's access to green spaces (see figure 8). Finally, a broader natural experiment with more situations will include

more qualitative insight about how people view those environments before and after a redesign (Seymour, 1969). A analysis of this kind will also provide a deeper explanation of how tastes for a certain area apply to usage.

Recommendation and Conclusion

Parks and open spaces are an aspect of sustainable planning that is highly significant in the everyday lives and social lives of people who live in urban areas like Dhaka. Parks should be the most active and affordable green space in a heavily populated metropolitan environment. Regardless, their importance is often ignored in the civil discourse regarding engineering and mounted frame. The usage of some design considerations that lead to sustainability and lower building costs, such as water conservation and the use of renewable energy in park lighting, as well as the reuse and recycling of materials in landscaping. Participation of residents in design decision-making and cost-sharing, as well as carrying out periodic routine repairs to ensure the park's sustainability. To overcome the obstacles, architects and researchers will aim to create a "Pocket Park Model" for women and girls. Compact local government, on the other hand, must progressively adjust the initiative for developing the 'Pocket Park,' as its utility, protection, connectivity, and productivity are essential for sustainable urban growth. When a city becomes a smart city, it can operate on a long-term digital infrastructure in which it is managed by a single system.

References

- Ahmed, B.; Kamruzzaman, M.; Zhu, X.; Rahman, M.; Choi, K. 2013. Simulating Land Cover Changes and Their Impacts on Land Surface Temperature in Dhaka, Bangladesh.
- Alvarsson, J. J., Wiens, S., and Nilsson, M. E. 2010. Stress Recovery during Exposure to Nature Sound and Environmental Noise. *International Journal of Environmental Research and Public Health*, 7, 1036–1046.
- Ansari, M. N. A. 2008. Opportunities and Challenges of Urban and Peri-urban Forestry and Greening in Bangladesh: Dhaka City as a Case. Master's Thesis, Department of Landscape Management, Design and Construction, Swedish University of Agricultural Sciences (SLU), Alnarp, Sweden.
- Appleton, J. 1975. *The experience of landscape*. London: Wiley.
- Baur, J. W. R. & Tynon, J. F. (2010). Small-Scale Urban Nature Parks: Why Should We Care? *Leisure Sciences*, 32, 195–200.
- Bangladesh Bureau of Statistics (BBS). 2011 Population and Housing Census: Preliminary Results; BBS: Dhaka, Bangladesh, 2012. Available online: http://bbs.portal.gov.bd/sites/default/files/files/bbs.portal.gov.bd/page/7b7b171a_731a_4854_8e0a_f8f7dede4a4a/PHC2011PreliminaryReport.pdf (accessed on 8 August 2019).
- Bangladesh Bureau of Statistics (BBS).2015. National Population and Housing Census 2011; BBS: Dhaka, Bangladesh.
- Baur, J. W. R. and Tynon, J. F. 2010. Small-Scale Urban Nature Parks: Why Should We Care? *Leisure Sciences*, 32, 195–200.
- Figueiredo, R. 2016. "Service Areas of Local Urban Green Spaces: An Explorative Approach in Arroios, Lisbon." Instituto Superior Técnico, University of Lisbon.
- Hitchings, R. 2010. Urban greenspace from the inside out: An argument for the approach and a study with city workers. *Geoforum*, 41(6), 855-864.

- Hossain, S. 2006. Social Characteristics of a Megacity: A Case of Dhaka City, Bangladesh. Proc TASA 2006 Conf, Perth, Australia: 4-7.
- Islam, S. T. 2002. Greening and Fading the Dhaka City: Past, Present and Future Perspectives. Unpublished Project Report. The Asiatic Society of Bangladesh, Dhaka. Bangladesh.
- Jarzen, J. 2014. How-To: Guide for Creating Pocket Park and Green Space Projects, Keep Indianapolis Beautiful, Inc.
- Kang, J., and Zhang, M. 2010. Semantic differential analysis of the soundscape in urban open public spaces. *Building and Environment*, 45, 150–157. doi:10.1016/j.buildenv.2009.05.014.
- Kong, F., Yin, H., Nakagoshi, N., and Zong, Y. (2010). Urban green space network development for biodiversity conservation: Identification based on graph theory and gravity modeling. *Landscape and Urban Planning*, 95(1), 16- 27.
- LeFlore, A. 2012. Increasing Urban Open Space through Pocket Parks, Tufts University, Massachusetts, USA.
- Lygum, V. L., Stigsdotter, U. A., Konijnendijk, C. C., & Højbjerg, H. 2013. Outdoor environments at Crisis Shelters: User needs and preferences with respect to design and activities. *International Journal of Architectural Research*, 7(1), 21.
- Maas, J., van Dillen, S. M. E., Verheij, R. A., & Groenewegen, P. P. 2009. Social contacts as a possible mechanism behind the relation between green space and health. *Health & Place*, 15(2), 586-595. doi: 10.1016/j.healthplace.2008.09.006.
- Ming, L. 2014. Investigating the Small Public Urban Open Spaces at High-Density Cities, Uppsala University, Sweden.
- Mitchell, R., and Popham, F. 2008. Effect of exposure to natural environment on health inequalities: an observational population study. *The Lancet*, 372(9650), 1655-1660. doi: 10.1016/S0140- 6736(08)61689-X.
- Nilsson, K., Sangster, M., Gallis, C., Hartig, T., de Vries, S., Seeland, K. et al. 2011. *Forests, Trees and Human Health* (1 ed.).
- Nordh, H., Hartig, T., Hagerhall, C. M., & Fry, G. 2009. Components of small urban parks that predict the possibility for restoration. *Urban Forestry & Urban Greening*, 8(4), 225-235. doi: 10.1016/j.ufug.2009.06.003.
- Peters, K., Elands, B., & Buijs, A. 2010. Social interactions in urban parks: Stimulating social cohesion? *Urban forestry & urban greening*, 9(2), 93-100.
- Schipperijn, J. 2010. *Use of urban green space* (Forest & Landscape, University of Copenhagen, Denmark).
- Seymour, W. N. 1969. *Small urban spaces: the philosophy, design, sociology and politics of vest pocket parks and other small urban open spaces*. New York: [s.n.].
- Shirley, A. 2013. The Possibility of Converting Available Spaces into Pocket Parks in Urban Settlements in Indonesia, E-Journal Eco-Teknologi UWIKA, Vol. I No. 1, pp. 1–6.
- Shirleyana. 2013. The Possibility of Converting Available Spaces into Pocket Parks in Urban Settlements in Indonesia, e-JETU, 1, 1-6, Universitas Widya Kartika, Surabaya.
- Stigsdotter, U. K., & Grahn, P. 2011. Stressed individuals' preferences for activities and environmental characteristics in green spaces. *Urban Forestry and Urban Greening*, 10(4), 295-304. doi: 10.1016/j.ufug.2011.07.001.
- Stigsdotter, U. K., Ekholm, O., Schipperijn, J., Toftager, M., Kamper-Jørgensen, F., & Randrup, T. B. 2010. Health promoting outdoor environments - Associations between green space, and health, health-related quality of life and stress based on a Danish national representative survey. *Scandinavian Journal of Public Health*, 38(4), 411-417.

- Swapan, S.M.; Zaman, U.A.; Ahsan, T.; Ahmed, F. 2017. Transforming Urban Dichotomies and Challenges of South Asian Megacities: Rethinking Sustainable Growth of Dhaka, Bangladesh. *Urban Sci*.
- Triman, J. 2012. Pocket Park Research: Small Public Urban Green Spaces, in Copenhagen, Denmark”, available at: <http://biophiliccities.org/pocket-parks-research-small-public-urban-green-spaces-spugsin-copenhagen-denmark/>.
- Ummeh, S and Kikuchi, T. 2017. Classification of Urban Parks and their Regional Characteristics in Dhaka City, Bangladesh, *Journal of Environmental Science and Engineering B* 6 (2017) 41-54. doi:10.17265/2162-5263/2017.01.005.
- Walker, C. 2004. *The Public Value of Urban Parks*, The Urban Institute, pp. 1–7.
- WHO. 1948. *Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference* New York, 19-22 June, 1946, signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no.2, p.100) and entered into force on 7 April 1948.
- Yilmaz, S., Zengin, M., & Yildiz, N. D. 2007. Determination of user profile at city parks: A sample from Turkey. *Building and Environment*, 42(6), 2325-2332.

Predictive Assessment on Suitability of Isabgul Cultivation, Prospects and Challenges in Bangladesh

Md. Nazrul Islam*

Abstract: This study was conducted on the Isabgul cultivation suitability and its challenges in Bangladesh. For the execution of the research, the primary and secondary data both were collected for the study from sites in Bangladesh. The primary data were collected for the year 2018-2019 and the secondary data are related to the year 1980-2020. Many statistical tools, matrix analysis and scenarios investigation were used for analysis the collected data in this study. For analysis the data some statistical tools including mean, percentage, correlation and regression coefficient were used. Furthermore, depending on spatial coverage of soil texture, soil pH and cultivatable agriculture land, suitability for Isabgul cultivatable land of this country is compute with GIS tools and techniques. From the GIS mapping, it is demonstrated the huge land are suitable for Isabgul cultivation in Bangladesh. Especially, the current study assess the soil pH, soil texture and drainage system for Isabgul cultivation processes, its prospects and challenges of Isabgul cultivation in Bangladesh. On the basis of soil pH and soil texture, it is identified that moderately alkaline soil (p^H range 7.3 to 8.4), good drainage system and sandy loam to loam soil texture are quite suitable for Isabgul cultivation at mid-western and north-western regions of Bangladesh. The weather which is needed to cultivate Isabgul are both cool and dry, which is also similar to Bangladesh's weather. A significant amount of labor is being put every year in cultivating Isabgul is numerous amounts. So, it is suggested that Bangladesh should follow the rules and regulations and start cultivating Isabgul in a profiting way by maintaining formalities. The outcomes of this research reflected that there is a huge Isabgul market in Bangladesh as well as globally. Bangladesh Government should need to concentrate on the cultivation of Isabgul crops. Farmers are required to change their traditional crop cultivation replace with Isabgul cultivation. Though the changes of new crop cultivation has the many challenges and constraints but this research could be the contemporary pathways which would open several new windows for cultivating Isabgul in Bangladesh.

Keywords: Isabgul, Public Health Safety, Economic Value, Cultivation Suitability, Bangladesh.

Introduction

The word "Isabgul" is from native Persia. Its scientific name is *Plantago Ovata* or *Psyllium* (Kalyansundram et al., 1984) which is comes from the Persian words "isap" and "ghol" which mean horse ear to describe the shape of the seed (Ah et al., 1988; Chevallier, 1996; Eric and Abrefa, 2011; Anjali and Renu 2015; Patel et al. 2020). Isabgul is one of the important medicinal crops which is a stem less herb and husk are the rosy-white membranous covering of the seeds. (Kapoor, 1990; Yadav, 2016; Patel et al. 2020). It has been mainly given as a safe laxative, particularly beneficial in habitual constipation, chronic diarrhea and dysentery (Dalal and Sriram, 1995; Patil and Patil,

* Professor, Department of Geography and Environment, Jahangirnagar University, Savar, Dhaka-1342, Bangladesh. E-mail: nazrul_geo@juniv.edu

2010; Islam et al., 2017; Ram and Roy, 2020). It is a natural product. It is a soluble fiber (is viscous and forms gel in water). The soluble fiber comes from the dried husk of the Psyllium seed. India is the top producer of Isabgul husk and seeds (Ganpat et al., 1992; Galindo et al., 2000; Deshpande et al., 2006). Isabgul is commercially Rabi crops (Gupta, 1987; Aighewi, 2000). Though its husk's use as medical properties, food industries also used including ice creams, biscuits and candies (Gupta, 1987; Handa and Kaul, 1999). Isabgul is widely used for relives constipation, control diarrhoea, improve digestion and cleanse colon and to cure piles and fissures (FAO, 1985; Farahnaki et al., 2010). It also helps lowering blood pressure and control diabetes (Chauchan, 2011; Anjali and Renu, 2015). There is no information about commercial cultivation of Isabgul has been started in Bangladesh.

In Bangladesh, the use of Isabgul has been increasing day by day. India is one of the top most producer of Isabgul in the world, more than 98 percent of Isabgul that India exports (Farahnaki et al., 2010; Islam et al., 2017). Isabgul is a is cultivated in sandy-loamy and loamy soils where drainage facilities are good with pH in between 7.3 to 8.4 and the soil moisture content is very low (Baghalian, 1999; Khan et al., 2000; Sharmin, 2004; Anjali and Renu 2015; Islam et al., 2017). There are some medicinal plants are cropped in Bangladesh but no reliable information that Isabgul is cultivated. It is expected that the soils of some districts of mid-western and north-western regions of Bangladesh are suitable for Isabgul cultivation (Ansari and Ali, 1996; Koul and Sareen, 1999). In Bangladesh tropical monsoon has found by variation of seasonal climatic factor such as rainfall, high temperature and high humidity (Azad, 2000; Islam et al., 2017). Minor variation of regional climate has found in this flat country. Three types of seasons has found in Bangladesh including a hot, muggy summer from March to June; a hot, humid and rainy monsoon season from June to November; and a warm-hot, dry winter from December to February (Khan et al., 2000; Joshua and Rahman, 2003). Normally, the highest temperature in summer seasons is between 38 to 41 °C (100.4 and 105.8 °F). Temperature is going to highest level in April. On the other hand, in January temperature reduced in average 16–20 °C (61–68 °F) during the day and 10 °C (50 °F) at night. Every year minimum 2,300 mm (90.6 in) of rainfall received in most of the parts in Bangladesh (Majmudar et al., 2002; Tauhidur et al., 2017; Ram and Roy, 2020). Monsoon winds has found in west and northwest region in Bangladesh because of its close location of Himalayas foothills. That's why 80% of rainfall is occurred in monsoon season.

There is no information of Isabgul cultivation in any region in Bangladesh. Palli Karma Sahayak Foundation (PKSF) has conducted a feasibility study on the cultivation of Isabgul in Bangladesh (Figure 1). Another study project has been taken by BRAC the situation of medicinal crops cultivation in Natore. Besides these, International Fund for Agricultural Development (IFAD) has taken project to Promote Agricultural Commercialization and Enterprise (PACE) project in 2014, where the project taken an initiative to promote Isabgul cultivation in the dry region of Jessore, Kusthia, Meherpur, Chapi Nawabganj, Rajshahi, Joypurhat and Bogra districts but no information is available publicly (Ansari and Ali, 1996; Kumar and Jha, 2000; Islam et al., 2017). Isabgul has great demand in various countries including U.S.A., U.K., France, Germany, Japan, Indonesia, Canada, Mexico Sweden, Spain, Norway, Italy, Australia, Denmark, South Korea, Pakistan, Gulf countries and some other small countries (Akinbode, 2002; Chauchan, 2011; Islam et al., 2017).

Background on Suitable Climatic Environment to Cultivate Isabgul

Basically, Isabgul is a cool season rabi crop and require dry sunny weather during its maturity season. Even seed shedding can happen because of light shows or cloudy weather (Aronoff, 1991; Handa and Kaul, 1999). The best suited soil for Isabgul cultivation is sandy loam or loamy soils (Jan, 2014; Islam et al., 2017). Well-drainage soil and optimum pH rate between 7.3 to 8.4. should be ensured. It is not suitable in poor drainage condition of soils (Bunting, 1981; Eric and Abrefa, 2011). Soil test is necessary for growing large, so that any required nutrient in the form of chemicals or organic manure can be supplemented in the soil (Yu et. Al., 2009; Anjali and Renu 2015) When it comes to seed rate of Isabgul, it requires 3 kg to 4 kg to cover 1.0 acre land or 8 to 9 kg to cover 1 hectare land 9 (Solanki and Shaktawat, 1999; Eric and Abrefa, 2011). During the month of October to November, seed should be sown in lines at maintain 15 cm distance.



Figure 1: Isabgul Cultivation Methods and Processing Scenarios.

Any crop yield depends on input of manures and fertilizers in time. Well decomposed farm yard manure (FMY) of 6 to 8 tons per 1 acre should be supplemented during land preparation (McNeil, 1989; Khamis et al., 2017). Isabgul crop responds well to inorganic fertilizers like N, P₂O₅, K₂O, and their ratio as 20:10:12 kg/acre. When applying nitrogen, half dose should be applied at the time of sowing and remaining after 4 weeks of sowing (Lokesh, 2014). Yield of Isabgul depends on many factors like variety, climate, soil and other crop management practices. On an average, one can obtain with good crop of 700 to 1000 kg per hectare land.

Aim and Objectives of the Study

The main aim of the study to assess the prospect of Isabgul cultivation and processing systems in Bangladesh. In order to achieve the aim of the study following scopes and relevant objectives were to be carried out.

- 1) To categorize the usefulness and importance's of Isabgul cultivation in Bangladesh,
- 2) To find out the constraints and opportunities of Isabgul cultivation region in Bangladesh;
- 3) To recommend a policy model for Isabgul cultivation and processing in Bangladesh.

Data and Methods

In order to achieve the objectives of the this study, it was required to delineate the soil and environment suitability of Isabgul cultivation in Bangladesh by using soil texture and

soil moisture index (SMI) assessment (Maria and Roberto, 2010). Along with the collected soil profile scenarios it was compared with the national soil texture information or spatial data to delineate the soil suitability area in Bangladesh for cultivating Isabgul. In addition to this analysis, digital elevation model has been used to re-delineate the area which are relatively higher and has good drainage situation. The delineated area should be justified by the field survey. A separate questionnaires were used to collect field survey from Isabgul importers, resellers, and consumers separately. These structured questionnaires have been developed during the research. And before conducting the field survey, the questionnaires have been brought into performance test through pre-test surveys. Necessary adjustments and modification were executed to have been done prior to conduct the primary survey. Soil texture, land types and drainage data collected from CEGIS archived. On the other hand, soil pH data collected from BCA archived. The production data were computed by the average yield of Isabgul per hectare. The Isabgul average yield has been assessed through the review of other country's practice preferably India and as well as the soil fertility. The annual national consumption has been assessed through the Isabgul import data and the retailer and importer survey data and through published and unpublished secondary sources. Both the primary and secondary data were collected for the study from sites in Bangladesh. The primary data on different aspects of the study i.e. general information about the respondents, their occupations, land use and cropping pattern, economics of cultivation of Isabgul, and their competitive crops, motivating and decision making factors etc. were collected from the sample respondents with the help of pre-tested interview schedules by semi-structured questionnaire.

The primary data were also collected from the traders of medicinal plants, regulated markets etc. Further, the secondary data of the study were collected from the horticulture center in Savar, ministry of forest and environment, Soil Research Development Institute (SRDI), Agricultural University, and statistical Office of Agriculture in published and unpublished sources including Bangladesh, India and Pakistan. The primary data were collected for the year 2018-2019 and the secondary data are related to the year 1980-2020. The general approach were implanted to collect spatial and non-spatial data. The existing consumption information of Isabgul were collected relevant ministry, and other organizations. The spatial data include soil map, soils moisture, soil type, precipitation data were also collected from different principal agencies. The suitable cultivated land was identified from reviewing the general soil type, top soil texture, soil moisture maps, following the identification of sandy loamy to loamy soil.

Delineation of Soil Layer

And finally, the suitable land for Isabgul can be delineated from SMI image layer overlying Soil moisture map. The logically consistence results from soil moisture map will then be produced. In this exercise, digital elevation model (DEM) can be used to deliberate higher lands which fall within the delineated soil moisture map carefully in Figure 2.

Cost Benefit Analysis (CBA) of Farming Isabgul Product

This section describes which methodology of CBA will be followed in the research study. There are two CBA methods described by two authors. First, Gittinger (1982) presented a methodology to assess agricultural projects both financially and economically. Second, Boardman (2011) offered a methodology not particular to the agricultural sector, but to any policy implemented at all levels. This work also showed how to calculate changes in

welfare in all participant agents. In addition, Net present value (NPV) and Internal Rate of Return will be assessed during the research study. The NPV is the present value of benefits minus the present value of costs as shown below:

$$NPV = PV (B) - PV(C)$$

On other relation

$$NPV = \sum_{T=1}^T \frac{C_t}{(1+r)^t} - C_0$$

Where,

C_t = net cash inflow during the period t

C_0 = total initial investment costs

r =rate, and

t = number of time periods

Carefully review above two views of two authors and will compare and applied the suitable CBA methodology during the proposed research study.

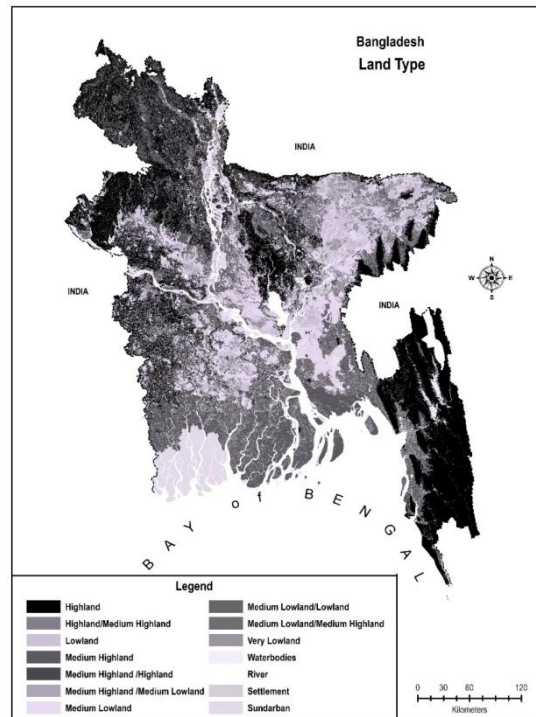


Figure 2: Land type classes have been presented in all around of Bangladesh. Produced map of land type designates that, highland were available in Barind Tract (some parts of Chapai Nawabganj, Naogaon, Joypurhat, Rangpur, Bogura and Dinajpur district), Madhupur Tract (Some parts of Tangail and Gazipur district) and Tertiary Hilly (Some parts of Khagrachari, Rangamati, Bandarban, Habiganj and Maulvibazar district) Region.

Source: After modified and regenerated from Islam et al., 2017

Results and Discussion

Land Type and Soil Resources in Bangladesh

The land type of Bangladesh is more complex and diversified. Spatial patterns of land type and their coverage were represent in Table 1. To get optimum contact of seed and soil as well as to achieve ideal soil moisture and avoid burying seed too deeply the fields need to irrigate before all processes. Maximum germination occurs at a seeding depth of 6 mm (1/4 in). Seed are frost sensitive; therefore, planting should be delayed to reach the frost free condition.

Table 1: Land types statistics of Bangladesh.

| Land Type | Area (ha) | Area (%) |
|---------------------------------|-----------|----------|
| Highland | 4151862 | 28.57 |
| Highland/Medium Highland | 299.055 | 0.00 |
| Lowland | 917687 | 6.31 |
| Medium Highland | 4401064.4 | 30.28 |
| Medium Highland /Highland | 1613.07 | 0.01 |
| Medium Highland /Medium Lowland | 1093.82 | 0.01 |
| Medium Lowland | 1692876 | 11.65 |
| Medium Lowland/Lowland | 2974.6 | 0.02 |
| Medium Lowland/Medium Highland | 5287.85 | 0.04 |
| River | 1003510 | 6.90 |
| Settlement | 1194160 | 8.22 |
| Sundarban | 432458 | 2.98 |
| Very Lowland | 276979 | 1.91 |
| No Data | 307388 | 2.11 |
| Waterbodies | 145162 | 1.00 |
| Grand Total | 14534415 | 100 |

Source: Bangladesh Soil Resources Development Institute (SRDI) (2018) Mrittika Bhaban Krishikhamar Saraka, Framgate, Khamaerbari, Dhaka, Bangladesh

The suitable soil for Isabgul cultivation is sandy loamy to loam. Due to large diversity and complexity of soil texture at short distance, in most cases it was not possible to map individual textural class basis, in that case most often more than one textural class had to be taken together to formulate a mapping unit. Figure-3: Soil texture categories have been presented in all around of Bangladesh (Islam et al., 2017). Red soil tract or Madhupur tract comprises parts of greater Dhaka and Mymensingh districts and extends through isolated tracts in Comilla and Noakhali towards south in Chittagong. This tract represents red later tic soils of Madhupur Jungle area a high land tract above the flood level intersected by numerous gentle depressions locally known as "Beels" which are highly valued for aman paddy. The soils are very clayey containing numerous ferruginous

concretions. The soils are deficient in nitrogen, organic matter, phosphate and lime, i.e., they are low in plant nutrients. The analytical figures for these nutrients in these soils are below the standard of the Bangladesh average. These soils are, however, relatively rich in iron and aluminum and are highly aggregated. The PH value lies between 5.5 and 6.

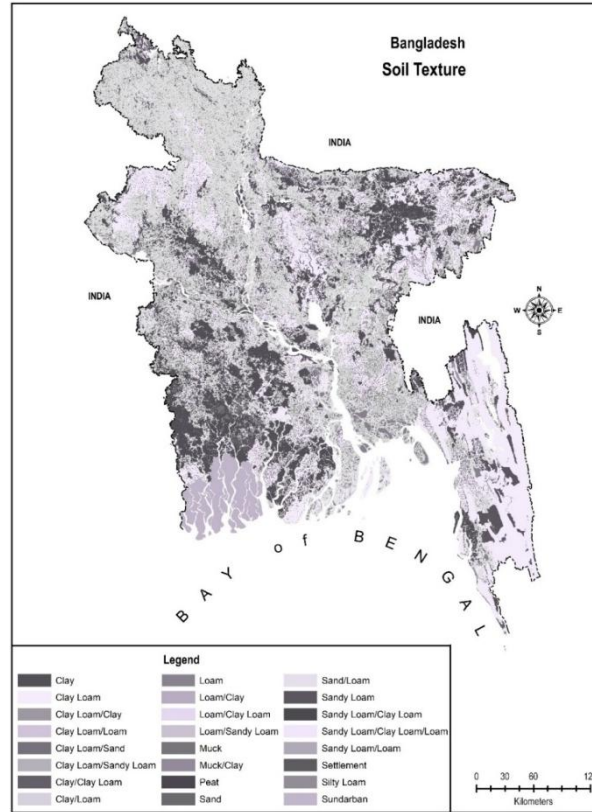


Figure 3: Soil texture categories have been presented in all around of Bangladesh. Produced map of soil texture indicates that, clay soils were available in parts of Faridpur, Rajbari, Kustia, Madaripur and Shariyatpur district. Loam soils were found in some parts of Mymensingh, Sherpur and Tangail etc.

Source: After modified and regenerated from Islam et al., 2017

Assessment of Isabgul National Consumption

The National consumption of Isabgul is one the main indicators to be assessed in this study. It seemed that the import information of Isabgul from India presents a significant amount of Isabgul that are satisfied by the demand. At present most of the pharmaceuticals and food industries are importing Isabgul for medicine and are needed to be balanced for making stable the Isabgul market situation. Moreover, it essential for food ingredients. Isabgul is also available in most of the retail shops. From this study findings that the use of Isabgul are increasing day by day in the country. In this scenario, supply sources and demand groups mapping spatial patterns of soil pH to identify suitable location for Isabgul cultivation (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020). For this reason spatial distribution of soil pH classes and their

spatial coverage were presented in Figure 4.a.; 4.b & 4.c and Table 3. So, that detail review and analysis will be required to identify the Sandy Loamy to Loam Sand from Top Soil Spatial Data.

Table 2: Soil Texture Classes in Bangladesh

| Soil Texture Classes | Area (ha) | Area (%) |
|---------------------------|-----------|----------|
| Clay | 2463848 | 16.952 |
| Clay Loam | 4551780 | 31.317 |
| Clay Loam/Clay | 15937.6 | 0.110 |
| Clay Loam/Loam | 24608.9 | 0.169 |
| Clay Loam/Sand | 1543.94 | 0.011 |
| Clay Loam/Sandy Loam | 1725.21 | 0.012 |
| Clay/Clay Loam | 43173.2 | 0.297 |
| Clay/Loam | 2843.81 | 0.020 |
| Loam | 3711970 | 25.539 |
| Loam/Clay | 890.284 | 0.006 |
| Loam/Clay Loam | 14146.8 | 0.097 |
| Loam/Sandy Loam | 11174.9 | 0.077 |
| Muck | 35319.3 | 0.243 |
| Muck/Clay | 1274.03 | 0.009 |
| Peat | 2779.22 | 0.019 |
| River | 1003510 | 6.904 |
| Sand | 119116 | 0.820 |
| Sand/Loam | 2813.81 | 0.019 |
| Sandy Loam | 401592 | 2.763 |
| Sandy Loam/Clay Loam | 13348.1 | 0.092 |
| Sandy Loam/Clay Loam/Loam | 252.264 | 0.002 |
| Sandy Loam/Loam | 16660.2 | 0.115 |
| Silty Loam | 11132.9 | 0.077 |
| Settlement | 1194161 | 8.216 |
| Char | 71725.4 | 0.493 |
| Waterbodies | 145162 | 0.999 |
| Sundarban | 432458 | 2.975 |
| No Data | 239467 | 1.648 |
| Grand Total | 14534414 | 100 |

Source: Bangladesh Soil Resources Development Institute (SRDI) (2018) Mrittika Bhaban Krishikhamar Saraka, Framgate, Khamaerbari, Dhaka, Bangladesh

The findings of this stud addressed the supply and demand issues. There are 20 individual soil textural classes were considered for topsoil texture in Bangladesh is shown in the Table 2 illustrates these top soil texture classes in percent area of hectare.

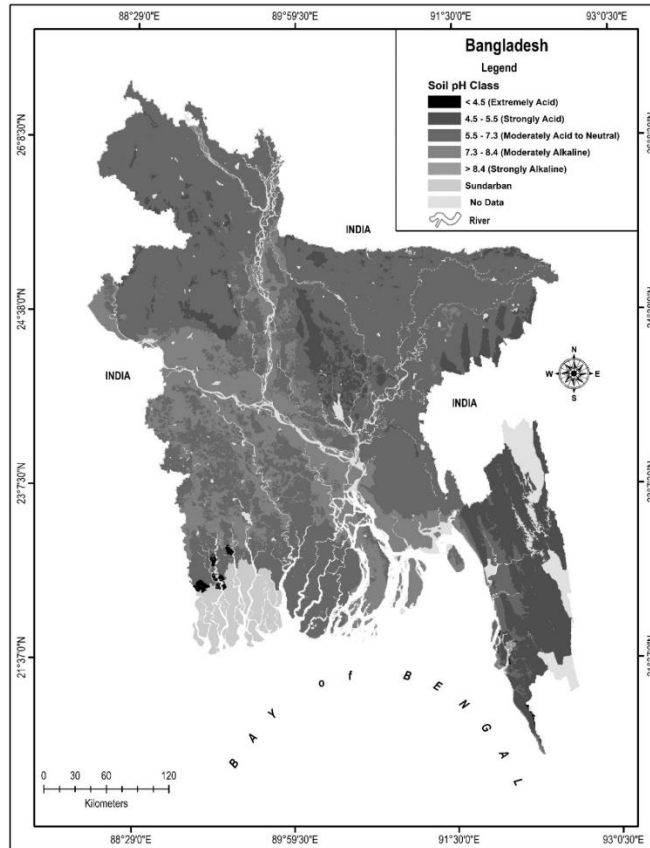


Figure-4.a): Soil p^H classes have been presented in all around of Bangladesh. Produced map of soil p^H classes discloses that, moderately alkaline soil were available along the Ganges-Padma, Brahmaputra-Jamuna and Meghna River Sides floodplain

Source: After modified and regenerated from Islam et al., 2017

The physical parameters of soils are important criteria in the land use and in land management as well. The soil texture ranged from silty clay to silt loam in the series, silty clay to clay in both. Silty clay and clay texture of the studied soils indicated that these are highly suitable for agriculture especially for rice cultivation under waterlogged condition (Hasan et al. 2012).

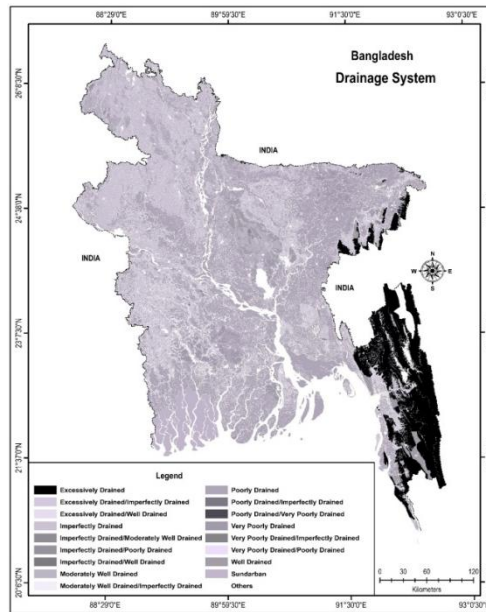


Figure 4.b): Drainage System of Bangladesh

The variation of sand, silt, clay is suggest that texture is due to sedimentary variations not soil forming processes. Silty loam to silty clay and clays are the predominant texture of the studied soil area (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020). The mean sand, silt and clay contents in the studied soils were 5, 35 and 60 percent, respectively (Majmudar et al., 2002; Hasan et al., 2012; Tauhidur et al., 2017). The sand content is too lower in these soil profiles (average 5%).

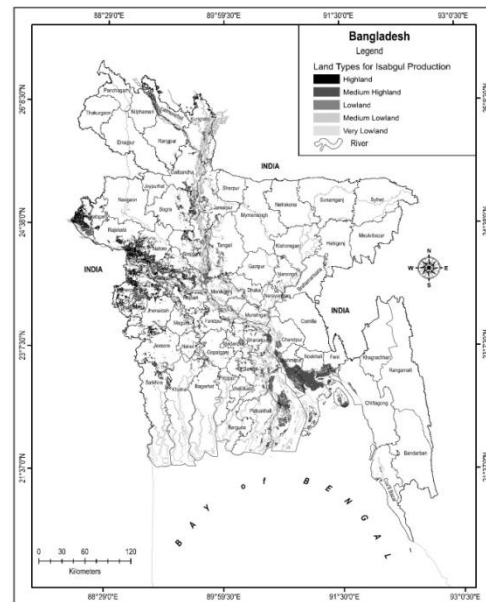


Figure 4.c): Relation of the Land use with the land-type has also been derived in the several groups for Isabgul production in Bangladesh

Table 3: Spatial statistics of soil p^H class in Bangladesh.

| Soil pH Class | Area (ha) | Area (%) |
|--|-----------|----------|
| < 4.5 (Extremely Acid) | 33126.97 | 0.239452 |
| 4.5 - 5.5 (Strongly Acid) | 1766782 | 12.77082 |
| 5.5 - 7.3 (Moderately Acid to Neutral) | 7747235 | 55.9993 |
| 7.3 - 8.4 (Moderately Alkaline) | 2777930 | 20.0797 |
| > 8.4 (Strongly Alkaline) | 5695.548 | 0.041169 |
| No Data | 1072918 | 7.755368 |
| Sundarban | 430833 | 3.114188 |

Source: Bangladesh Soil Resources Development Institute (SRDI) (2018) Mrittika Bhaban Krishikhamar Saraka, Framgate, Khamaerbari, Dhaka, Bangladesh

Table 4: Top Soil Texture Classes in Bangladesh

| Topsoil Texture | Area (ha) | Percentage |
|--|------------|------------|
| Sand | 90,579 | 0.80% |
| Loamy Sand | 36,205 | 0.31% |
| Loamy Fine Sand | 35,533 | 0.31% |
| Sandy Loam | 559,725 | 4.80% |
| Fine Sandy Loam | 202,892 | 1.80% |
| Very Fine Sandy Loam | 9,657 | 0.10% |
| Gravelly Sandy Clay Loam | 199 | 0.00% |
| Sandy Clay Loam | 24,616 | 0.20% |
| Loam | 1,214,578 | 10.50% |
| Silt | 25,863 | 0.20% |
| Silt Loam | 3,617,433 | 31.30% |
| Gravelly Clay Loam | 4,740 | 0.04% |
| Silty Clay Loam | 1,365,183 | 11.80% |
| Clay Loam | 196,064 | 1.70% |
| Silty Clay | 2,131,260 | 18.40% |
| Clay | 2,013,795 | 17.40% |
| Mucky Clay | 4,930 | 0.04% |
| Muck | 10,316 | 0.10% |
| Peaty Muck | 11,479 | 0.10% |
| Peat | 6,910 | 0.06% |
| Total Cultivable Area | 11,561,957 | 100.00% |
| Miscellaneous Land (Urban, Water, Reserve Forest, Sundarban) | | 2,924,321 |
| Total Area | | 14,486,278 |

Source: Eric and Abrefa 2011; Bangladesh Agricultural Research Council (BARC) (2018) Land Resources Appraisal of Bangladesh for Agricultural, Khamarbari Road, Dhaka 1215, Bangladesh

Land Suitability of Isabgul Production in Bangladesh

By cultivating Isabgul, it is possible to earn lots of revenue from exporting and even to serve the purpose locally. The environment of Bangladesh could be the suitable to cultivate Isabgul production. It required 26/27 degrees to grow which is Bangladesh average temperature (Sitton and Milner, 1980; Sudhanshu, et al., 2010; Patel et al., 2020). Sandy loam to loamy soils are suitable for Isabgul that's also the soil texture of Bangladesh. Bangladesh farmers cultivating this special type of crop which is popular and almost wanted by all the countries all around the world. Bangladesh has some suitable land resources for cultivating Isabgul production.

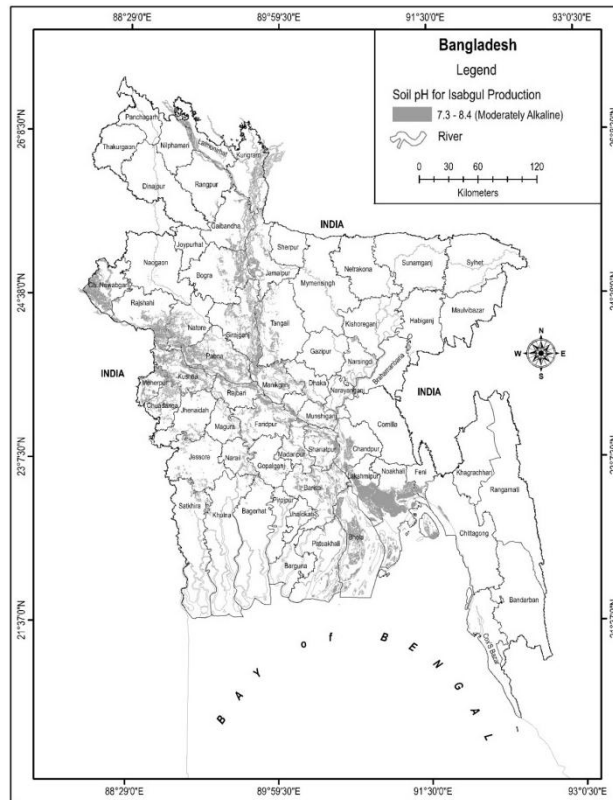


Fig. 5: Spatial distribution of suitable soil pH^H range for Isabgul cultivation in Bangladesh.

On the basis of land type, soil texture and soil pH, Isabgul production land suitability in Bangladesh has been estimated with GIS environment. Generally, medium high land is more suitable for Isabgul production in Bangladesh. Spatially, Bogra, Tangail, Chapai Nawabganj, Kurigram Gaibandha, Kushtia, Sirajganj, Pabna, Jamalpur, Rajshahi, Manikganj, Faridpur, Jessore, Chuadanga, Barisal, Noakhali, Lalmonirhat, Shariatpur etc. districts are suitable for Isabgul cultivation. The suitability for Isabgul production land types estimate as 348659.46 ha, 492579.56 ha, 29273.53 ha, 104712.17 ha, and 661.35 ha and these flowed by highland, medium highland, lowland, medium lowland and very lowland, respectively (Figure-05) (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020).

It becomes apparent that, sandy loam and loam soil texture spatial coverage have been computed as 35574.715 ha and 940311.35 ha, respectively, which is requirement for Isabgul cultivation in Bangladesh. In addition, loam soil texture is more suitable for Isabgul production of this country (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020). In fact, there are 975886.066ha land area which pH level 7.3-8.4 (Moderately Alkaline) has been estimated as suitability for Isabgul production cultivation in Bangladesh. All weed and materials must be remove from field before cultivation. After that, it should be ploughed enough times. The ploughing must be done so that the soil becomes smooth and easy for cultivation. After that, harrowing and leveling must be done (Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020; Ram and Roy). Drainage channels must be present in the field. To drain the excess water away from the field, drainage channels must be present in the field. Proper quantities of farmyard manure must be provided in the field after the ploughing is done. The land preparation must be done properly. A proper land is important for the good growth of the Isabgul plants.

The Isabgul plants grow well in cool climates. It is suitable for growing in temperate regions. During sowing time, it needs cooler climates. During harvesting, dry weather is needed. In addition, warm and sunny climate needs throughout the year for proper growing of plants. The Isabgul crop is very sensitive to extreme weather. Even dew, rainfall or frost can cause loss of yield. The cloudy weather is also very harmful to the seed formation period. So, the monsoon season must be avoided for the sowing of the Isabgul. The humid weather condition should be avoided at the time of maturity which may causes loss of the yield. The ideal temperature for the cultivation of Isabgul is 24-34 degree Celsius

Isabgul Consumption in Bangladesh

The national demand of Isabgul are mostly depend on Isabgul Import. No national domestic consumption data or no domestic production data are available. India is the top most producer of Isabgul in the world, more than 98% Isabgul that India are exporting to different countries. As we can see from the whole research that Isabgul cultivation is very rare in Bangladesh. We almost have nothing major cultivation program to increase or inaugurate the cultivation of this mostly used product. We also cam presume the amount of money being used to buy this product from the neighboring country (Table-6) (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020). Every year many countries around the world come to business to the producing country to buy Isabgul from them and India makes a great out of this. So, if we look at the dark side, we are spending a lot on a product which can be cultivated in our country and we are also spending a lot of money on the purchase of this product.

This certain product or plant or seed is very helpful to the mankind. Constipation, Diarrhea, digestion, diabetes is being treated well by Isabgul and for heart diseases Isabgul works like a medicine. This is why Isabgul is being used in many countries and has also gained popularity around the sub-continent. So, if we look at the bright side and ask our-self a question, “Is there any difference in India’s soil, weather and resources compared to Bangladesh’s?” the answer is, not significantly. The type of soil on India is cultivating Isabgul shares the same qualities like the soil of our country. The weather which is needed to cultivate Isabgul are both cool and dry, which is also similar to

Bangladesh's weather (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020). A significant amount of labor is being put every year in cultivating Isabgul is numerous amounts. So, it is suggested that Bangladesh should follow the rules and regulations and start cultivating Isabgul in a profiting way by maintaining formalities. Isabgul plant is very sensitive as we all know and for that we need to use strict measures.

Table 6: Statistics of Importing Countries of Isabgul Husk from India

| Importing Countries of Isabgul husk from India | | | | | | Export in M.T |
|--|------------------|------------------|------------------|------------------|------------------|------------------|
| Country | 2010-11 | 2011-12 | 2011-13 | 2011-14 | 2011-15 | 2017-18 |
| USA | 14,820.12 | 15,318.22 | 23,282.15 | 14,717.16 | 13,883.73 | 8,198.24 |
| Pakistan | 2,296.32 | 2,012.52 | 3,023.52 | 3,062.46 | 2,233.75 | 642.55 |
| Germany | 1,914.42 | 1,766.11 | 2,799.79 | 3,154.18 | 3,793.67 | 2,143.06 |
| Mexico | 1,006.00 | 1,256.00 | 1,459.64 | 1,406.01 | 1,367.00 | 719.00 |
| Bangladesh | 940.80 | 637.07 | 712.48 | 326.00 | 666.82 | 879.07 |
| Australia | 646.48 | 774.62 | 863.92 | 926.71 | 800.45 | 534.65 |
| UK | 619.71 | 1,090.72 | 715.24 | 1,305.26 | 1,414.37 | 889.55 |
| Italy | 584.59 | 694.58 | 786.74 | 1,085.07 | 1,145.48 | 881.06 |
| Malaysia | 283.73 | 507.10 | 440.93 | 461.80 | 537.46 | 503.03 |
| France | 314.59 | 428.24 | 676.42 | 713.70 | 991.69 | 388.00 |
| Belgium | 443.30 | 423.30 | 540.00 | 616.62 | 515.77 | 304.02 |
| China | 266.55 | 359.28 | 235.43 | 585.58 | 606.50 | 379.08 |
| Others | 16,375.55 | 4,075.86 | 4,134.49 | 4,105.03 | 4,368.95 | 2,616.53 |
| Total | 40,512.16 | 29,343.62 | 39,670.75 | 32,465.58 | 32,325.64 | 19,077.84 |

Source: Director General of Foreign Trade & Government of India, 2018 & Bangladesh Soil Resources Development Institute (SRDI, 2018), Dhaka, Bangladesh

Developing the Policy Model for Isabgul Cultivation Strategies in Bangladesh

The population we have in Bangladesh and the amount of lands abandoned which are not being used can be used to start something new. Again, we have resources like labor, which is very cheap in our country comparative to other countries, so we can cultivate tons of Isabgul and we can use it for our own good, which is going to reduce the amount of money we spend on importing (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020). Again if we are able to produce more than what is needed then the country can earn foreign currency through exports. As our soil is fertile and light, which is needed to cultivate Isabgul and our weather or climate is very friendly for the cultivation. We have both winter and summer seasons which are necessary for the cultivation of Isabgul.

So in the end what we need is actually find the difference between how much technology has been developed and how much has been being used for the mankind. There are new machines like seed sower to sow the seeds, Harvester for harvesting the grown crops,

drum seeder which also sows the seeds, new piping system which flows water to places where it is only needed and to get the information about future climate there are many tools which are being used in developed countries. There are many NGO's in our country which often distribute sound conditioned seeds, fertilizers to the farmers at a cheap rate or freely. These organizations and the government should take necessary steps to distribute proper knowledge of farming and cultivating to the illiterate farmers and should also take necessary steps to distribute the seeds and fertilizers. The farmers of this country and also of India have to know the proper drilling of farming, usage of fertilizers and seeds, the timing of harvesting etc. The private investors of Bangladesh should also come to invest in this type of projects which is quite fair-looking and bright.

The Isabgul is mainly cultivated in India and Bangladesh. It is mainly produced in India. It is also exported to other countries from here. In India, Isabgul is mainly produced in the states of Rajasthan and Gujarat in India. Apart from India, Isabgul is cultivated in small quantities in the USA and other countries too.

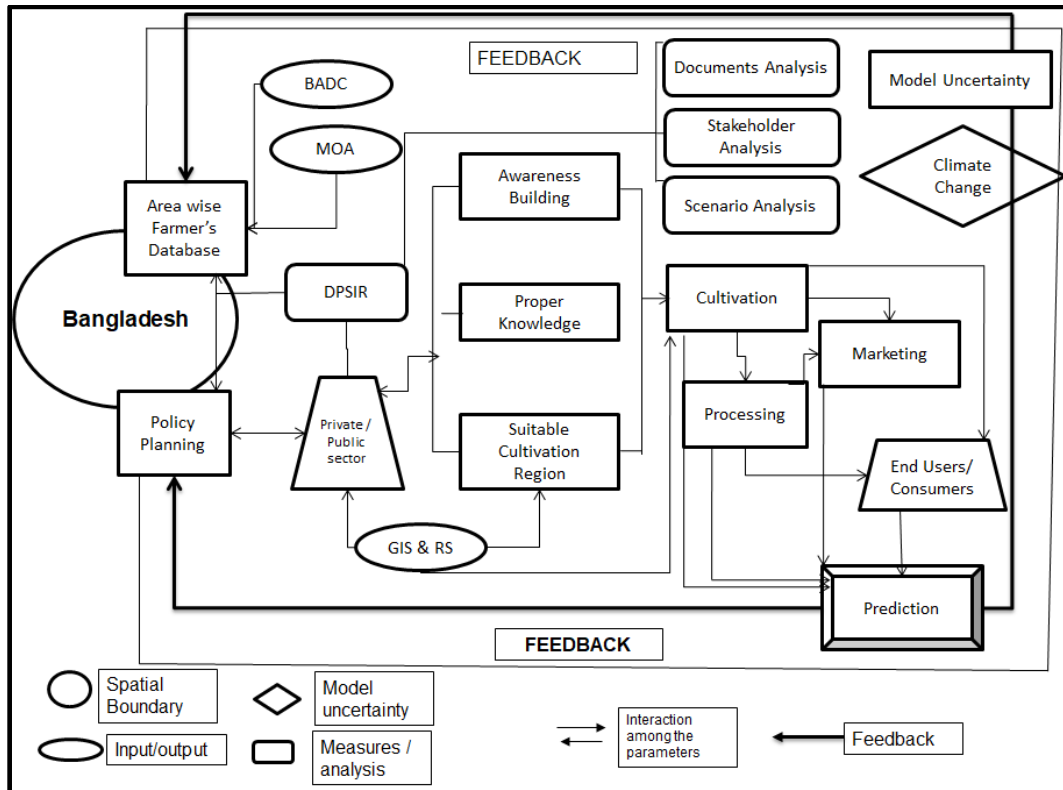


Figure 6: CuP Model for Predicting Isabgul Cultivation and Processing Systems in Bangladesh

Entire Bangladesh has been taken as spatial boundary of this Cultivation and Processing (CuP) Model for predicting Isabgul cultivation and processing systems in Bangladesh. Agriculture is the largest employment sector in Bangladesh (Figure-6). The continuous development of Isabgul production has an overwhelming impact on major macroeconomic objectives like employment generation, poverty alleviation, human

resources development, food security etc. A plurality of Bangladeshis earn their living from agriculture. Though rice and jute are the primary crops in Bangladesh, wheat is assuming great importance and demand. Tea is grown in the northeast. Because of Bangladesh's fertile soil and normally ample water supply, rice can be grown and harvested three times a year in many areas (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020; Ram and Roy). Although many unfavorable climatic conditions often disturb, some factors of labor-intensive agriculture increase the steady achievement in food grain production in Bangladesh. Some steps such as better flood control and irrigation system, efficient use of fertilizers as well as better distribution of rural credit networks are the main factors of this achievement. Rice is the main crop in Bangladesh with 35.8 million metric tons produced in 2000. But insecticides represent an environmental threat also make high cost of poor rice farmers.

Future Prospect and Challenges

As increasing the demand of Isabgul in the country, and as the soil suitability is met, there will be a great prospect for cultivating Isabgul crop. As mentioned in this proposal that the cultivation of Isabgul are suitable for sandy loamy and loamy soil with good drainage facility. Having these characteristics of soils, Jessore, Kushtia, Meherpur, Bogra, Joypurhat, Chapai Nawabganj, Natore and Rajshahi district area are more suitable for cultivating Isabgul crops during Robi season. But these areas are being cultivated by other Robi crops during dry season (Islam et al., 2017). The researchers mentioned in different journals and publications that the market selling price of Isabgul is much higher than the farming input costs. It also earns more financially benefited than other Robi crops. The farmers of the selected areas where Isabgul are suitable for cultivation will bring into awareness and motivational programs and make them understand the benefit of cultivating Isabgul in place of their present practice (Sharmin, 2004). There are many challenges which will be faced while introducing Isabgul cultivation in the selected areas. The proposed research study will clearly address these issues along with their possible solutions for cultivating Isabgul crops.

Discussion

The Isabgul cultivation is quite well in well-drained soils. So, such soils must be used. Light soils should be used for the Isabgul cultivation. The ideal pH for the cultivation of Isabgul is pH value 4.7-7.7. The soil which is used for cultivation must have a low moisture content. This supports the growth of the Isabgul plants. It can be grown in almost any kind of soil. But, the Isabgul plants produce best results in silt or loam soils (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020; Ram and Roy). Such conditions can ensure that the yield of the seeds is high. The soil must be high in nutrients. Fertile soil is very much needed for the proper growth of the Isabgul production. The pH of the soil should not be too high or too low. Heavy soils must be avoided for Isabgul cultivation.

Isabgul is suitable for growing in temperate regions. During sowing time, it needs cooler climates. During harvesting, dry weather is needed. Also, it needs a warm and sunny climate throughout the year. The Isabgul crop is very sensitive to extreme weather. Even dew, rainfall or frost can cause loss of yield. The cloudy weather is also very harmful to

the seed formation. So, the monsoon season must be avoided for the sowing of the Isabgul. The humid weather must be avoided at the time of maturity. It causes loss of the yield. The ideal temperature for the cultivation of Isabgul is 24-34 degree Celsius.

The land must be cleared of all the weeds and materials of previous cultivation. After that, it should be ploughed enough times. The Isabgul is mainly used for the treatment of constipation. Apart from that, it is also used for the preparation of many food items. There are many species of Isabgul which are cultivated for commercial purposes. The cultivation of Isabgul is easy. To get a good amount of profit, the cultivation techniques of Isabgul must be improved. Modern and scientific methods must be introduced in Isabgul cultivation. Export of Isabgul is also done. For good profit earning, the Isabgul seed quality also has to be improved (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017; Patel et al. 2020; Ram and Roy). Only then, the yield will also be higher. Isabgul has a very good and booming market in the local area. Proper and commercial cultivation of this grain can also increase the exports. Giving proper nutrition and irrigation to the Isabgul crop can help to increase the yield and quality. Isabgul is an important crop to be cultivated. Due to its immense health benefits, Isabgul has been used among people since decades. Even today, the popularity of Isabgul is high in the market. The demand for high-quality Isabgul is increasing too. At such a time, cultivation of Isabgul on a large scale is very important.

In recent years, there has been considerable research related to the marketing of Isabgul cultivation. These papers, however, mostly deal with problems, challenges and development of and the government initiatives toward Isabgul cultivation. Government of Bangladesh concentrates on a select but important set of policy issues confronting Bangladeshi agriculture to come up with recommendations that would help bring about a second Green Revolution in Bangladesh and sustain robust growth in agriculture and also the cultivation of Isabgul (Sharmin, 2004; Patil and Patil, 2010; Islam et al., 2017). Five such issues have been chosen: measures necessary to raise productivity, policies ensuring remunerative prices for farmers, reforms necessary in the area of land leasing and titles, a mechanism to bring quick relief to farmers hit by natural disasters, and initiatives necessary to spread green revolution and also the cultivation Isabgul.

Comparison with other Countries and Global Perspectives

On the basis of regions, the Isabgul market has been segmented into North America, Latin America, Western and Eastern Europe, Asia-Pacific region, Japan, Middle East and Africa. Isabgul seed is originated from Iran and increased its travel from Asia to Europe (Patel et al. 2020; Ram and Roy, 2020). Production of Isabgul seeds mainly comes from Arab world, Afghanistan, Egypt, North India, Sindh, Baluchistan etc. for medicinal purposes. Europe is emerging in Isabgul seed market for consumption as well as production. Currently, India is the largest producer of Isabgul seeds. Global Isabgul husk market over the forecast period resulted by the booming supplement market in the region and natural based pharmaceutical market in the region. The Asia Pacific to follow next which is attributed to its traditional use in the region as a remedy for problems occurring with digestive system (Patel et al. 2020; Ram and Roy, 2020). Europe to see significant growth for organic Isabgul husk resulted by the regulation placed by the authorities for curving out GMO and non-organic ingredients in supplements and pharmaceutical in the

region. Latin America, Middle East and Africa to post substantial volume consumption owing to the increasing aged population in the region.

Limitation of this Study

Isabgul is not cultivated in Bangladesh yet. The limitations which are seen so far are farmers not having proper knowledge of cultivation, bad condition of seeds and fertilizers, not having sound condition of the soil, proper drainage system and timing of sowing the seeds. If we are able to eliminate these problems we will be able to pull out something big for the country in both economically and environmentally. Increasing working class population in developing region is aligned with the increasing laxative drug consumption due to sedentary lifestyle resulting in demand for Isabgul husk over the regions. The aging population is susceptible to digestive problem which is attributed to fuel demand for Isabgul husk in developed region with an aging population. The Isabgul market is expected to face restraint from other natural laxatives available in the market with added benefits and also from the synthetic laxative available at comparatively cheaper cost.

So, if we look at the dark side, we are spending a lot on a product which can be cultivated in our country and we are also spending a lot of money on the purchase of this product. This certain product or plant or seed is very helpful to the mankind. Constipation, Diarrhea, digestion, diabetes is being treated well by Isabgul and for heart diseases Isabgul works like a medicine. This is why Isabgul is being used in many countries and has also gained popularity around the sub-continent.

In future correspondence, by integrating Land Ecological Suitability Evaluation (LESE) Model with GIS tools we would be able to prepare several suitable mapping for Isabgul production in Bangladesh. The GIS-LESE integrated tools are a computer based analysis for mapping and analyzing spatial data. Especially, temperature, rainfall, humidity, slope, altitude, soil type, and soil texture will be selected from climate, topography, and soil factors as the factors for land ecological evaluation by the Delphi method based on the ecological characteristics of Isabgul Production in Bangladesh.

Conclusion

A wide range of Isabgul market in Bangladesh as well as globally. Bangladesh Government should need to concentrate on the cultivation of Isabgul crops. The soils of mid-western and north-western regions of Bangladesh are suitable for Isabgul cultivation. Farmers are required to change their traditional crop cultivation replace with Isabgul cultivation. The technical and financial support from government will speed up to introduce Isabgul cultivation. The change of new crop cultivation is one of the challenges and constraints. This research topics is contemporary which would open several new windows for cultivating Isabgul in Bangladesh. There are a numerous research scopes in Bangladesh but the researcher or scientist can't afford the high expenses and sometimes not able to get support from sophisticated instrument use. The corporate agencies or banks are required to coming forward to support to the research work. Bangladesh has a great potential to cultivate Isabgul and could be exported to other countries even after satisfy the demand in the country. Isabgul will then be an export item and could contribute to the country's economy.

Acknowledgement

The corresponding author would like to convey special thanks and gratefulness to the Faculty of Social Science, Jahangirnagar University and University Grants Commission (UGC) those have been provided the funding support to complete this research project 2017-2018 academic session. The success and final outcomes of this report required a lot of guidance and assistance from many people and we are extremely fortunate to have got this all along the completion of our research report work. We would like to express our deepest appreciation to all those from where/who we have used the secondary data and tools.

References

- Ah, Q., Abdullah, P. & Ibrar, M. (1988). Effect of some environmental factors on germination and growth of *Plantago ovata* Forsk. *Pakistan J. Forestry*, 38: 143-55.
- Aighewi, I. T. (2000). Diagnostic Survey of Soil Management Techniques by Food Crop Farmers: A Case Study of Edo State, Nigeria. *Nigerian Journal of Soil Science*, 12: 22-34.
- Akinbode, A. (2002). *Introductory Environmental Resource Management*. Ibadan, Nigeria: Daybis Ltd. U.I. Ibadan, Nigeria, pp. 82-84.
- Anjali, V. & Renu. M. (2015). Psyllium (*Plantago ovata*) Husk: A Wonder Food for Good Health. *International Journal of Science and Research (IJSR)*, ISSN (Online): 2319-7064
- Ansari, S. H. & Ali, M. (1996). Chemical, Pharmacological and Clinical Evaluation of *Plantago ovata* Forsk. *Hamdard Medicus*, 39: 63-85.
- Aronoff, S. (1991). *Geographic Information System. A Management Perspective*. WLD Publications, Ottawa, ON, Canada.
- Azad, A.K. (2000). A Study of Some Physical and Chemical Properties of Saline and Non-Saline Soils of Bangladesh. M.Sc. Thesis, Department of Soil Science, Bangladesh Agricultural University, Mymensingh.
- Bangladesh Soil Resources Development Institute (SRDI) (2018) *Mrittika Bhaban Krishikhmar Saraka, Framgate, Khamaerbari, Dhaka, Bangladesh*
- Bangladesh Agricultural Research Council (BARC) (2018) *Land Resources Appraisal of Bangladesh for Agricultural, Khamarbari Road, Dhaka 1215, Bangladesh*
- Baghalian, K. (1999). Effects of Air Humidity and Soil Moisture on Quality and Quantity of Mucilage in Seed of *Plantago ovata* Forsk. M. Sc. Thesis, University of Tehran, Iran.
- Bunting, E. S. (1981). Assessments of the effects on yield of variations in climate and soil characteristics for twenty crop species. Centre for Soil Research. Bogor, Indonesia, UNDP/FAO, AGOF/ INS/78/006 Technical Note No. 12.
- Chauchan, N.M. (2011). Impact and yield fissures inspection of gram through trainings and FLD's by KVK Tapi in Gujarat. *Indian J. of Agricultural Research and Extension*, 4:12-15.
- Chevallier, A. (1996). *The Encyclopedia of Medicinal Plants*. Dorling Kindersley, London, UK.
- Dalal, K.C. & Sriram, S. (1995). Psyllium. In: *Advances in Horticulture*, Vol. 11 (Eds., Chadha, K.L. and Gupta, R.). pp. 575-604. Malhotra Publishing House, New Delhi, India.
- Deshpande, R. S., Neelakanta, N.T. & Naveen, H. (2006). *Cultivation of Medical Crops and Aromatic Crops as a Means of Diversification in agricultural*.
- Eric K. F., Abrefa K., N. (2011). Digital Soil Mapping in GIS Environment for Crop-Land Suitability Analysis. *International Journal of Geomatics and Geosciences*, 2 (1): 201.

- FAO, (1985). Guidelines. Land Evaluation for Irrigated Agriculture. FAO Soils Bulletin No. 55, Rome.
- Farahnaki, A., Askari, H., Majzoobi, M. & Mesbahi, G.H. (2010). The impact of concentration, temperature and pH on dynamic rheology of Psyllium gels. *J. of Food Engineering*, pp.1-8.
- Galindo, P. A., Gómez, E., Feo, F., Borja, J. & Rodriguez, R. G. (2000). Occupational Asthma Caused by Psyllium Dust (*Plantago ovata*). In: The 6th Internet World Congress for Biomedical Sciences. Available on http://www.uclm.es/inabis2000/posters/pdf/p_085.pdf.
- Ganpat, S., Ishawar, S., Bhati, D. S. & Singh, G. (1992). Response of *Plantago ovata* to Irrigation and Split Application of Nitrogen. *Indian J. Agr. Sci.*, 37: 880-881.
- Gupta, R. (1987). Medicinal and Aromatic Plants. Handbook of Agriculture, Indian Council of Agriculture Research, New Delhi, India, pp. 1188-1224.
- Handa, S. S. & Kaul, M. K. (1999). Supplement to Cultivation and Utilization of Medicinal Plants. Regional Research Laboratory Council of Scientific and Industrial Research, Jammu-Tawi, India.
- Hasan, M.K. Mohiuddin, A. S. M., Uddin M.J (2012) Characterization of Some Representative oils From the Ganges Floodplain of Bangladesh, *Dhaka Univ. J. Biol. Sci.* **21**(2): 201-205
- Islam, M. A., Hasan, M. A. & Farukh, M. A. (2017). Application of GIS in General Soil Mapping of Bangladesh. *Journal of Geographic Information System*, 9: 604-621.
- Jan, H. (2014). Soil moisture modelling using TWI and satellite imagery in the Stockholm region. School of Architecture and the Built Environment Royal Institute of Technology (KTH) 100 44 Stockholm, Sweden.
- Joshua, W.D. & Rahman, M. (2003). Physical Properties of Soil on the Tista River Floodplain and Barind Tract of Bangladesh. Soil Resource Development Institute, Dhaka, pp.13-40.
- Kalyansundram, N. K., Sriram, S., Patel, B. R., Patel, D. H., Dalal, K. C. & Gupta, R. (1984). Psyllium: A Monopoly of Gujarat. *Indian Hort.*, 28: 35-37.
- Kapoor, L. D. (1990). Handbook of Ayurvedic Medicinal Plants. CRC Press, Boca Raton, Florida, pp. 267.
- Khamis, N. S., Haitham, A. A., Nur, S. M. & Ahmed, E. (2017). Development of a Spatial Hydrologic Soil Map Using Spectral Reflectance Band Recognition and a Multiple-Output Artificial Neural Network Model. *Hydrol. Earth Syst. Sci. Discuss.*, doi:10.5194/hess-2017-13.
- Khan, Z.H., Mazumder, A.R., Mohiuddin, A.S.M., Hussain, M.S. & Saheed, S.M. (2000). Physical Properties of Some Benchmark Soils from the Floodplains of Bangladesh. *Journal of Indian Social Soil Science*, 46: 442-446.
- Koul, A. K. & Sareen, S. (1999). *Plantago ovata* Forsk: Cultivation, Botany, Utilization and Improvement. In: "Supplement to Cultivation and Utilization of Medicinal Plants." (Eds.): Hand, S. S. and Kaul, M. K. Regional Research Laboratory Council of Scientific and Industrial Research, Jammu-Tawi, India. pp. 477-495.
- Kumar, D. & Jha, B.K. (2000). Studies on performance of Isabgol (*Plantago ovata* Forsk.) genotypes in middle Gujarat condition. *Indian J.Hort.* 57: 264-67.
- Lokesh K. & Jain (2014). Economics and Gap Analysis in Isabgul Cultivation through Frontline Demonstration in Western Rajsthan. *International Journal for Agricultural Extension*, 2(2):109-114.
- Majmudar, H., Mourya, V., Devdhe, S. and Chandak, R. (2002). Pharmaceutical Applications of Ispaghula Husk: Mucilage. *International J. of Pharmaceutical Sciences Review & Research*, 18(1):49-55.

- Maria H. L. & Roberto, S. (2010). Satellite Remote Sensing of Soil Moisture. A dissertation submitted in partial fulfilment of the requirement for the degree of Master of Science in Applied Meteorology, Department of Meteorology, University of Reading.
- McNeil, D.L. (1989). Factors affecting the field establishment of *Plantago ovata* Forsk in northern.
- Orhan, D. (2013). Land suitability assessment for rice cultivation based on GIS modeling. *Turkish Journal of Agriculture and Forestry*, 37: 326-334. doi:10.3906/tar-1206-51.
- Patil, D. A. & Patil M.,V. (2010). Diversity and Concerns of Indian Medicinal Plants: A Scenario. *Journal of Ecobiotechnology*, 2(8): 14-20. ISSN: 2077-0464.
- Patel, S., Pachhigar, K., Ganvit, R. et al (2020). Exploring Flowering Genes in Isabgol (*Plantago ovata* Forsk.) Through Transcriptome Analysis. *Plant Mol Biol Rep* (2020). <https://doi.org/10.1007/s11105-020-01237-8>
- Ram Prasanna Meena, Satyajit Roy (2020) Morphological and molecular characterization of *Fusarium* sp. causing wilt disease of isabgol (*Plantago ovata* Forsk.) and its management strategies, *Journal of Applied Research on Medicinal and Aromatic Plants*, Volume 16, 2020, 100244, ISSN 2214-7861, <https://doi.org/10.1016/j.jarmap.2020.100244>.
- Sharmin, L. (2004). Cultivation prospect of medicinal plants in Bangladesh: experiences from Natore. BRAC, Dhaka, Bangladesh.
- Sitton, D. & Milner, N.A. (1980). Cultivation of *Plantago ovata*. Ben. Gurian University Negev Research and Development Authority, Applied Research Institute. *Scientific Activities*, p. 74.
- Solanki, N.S. & Shaktawat, R.P.S. (1999). Effect of date of sowing and nitrogen on growth and yield of Isabgol (*Plantago ovata*). *Indian J. Agric. Sci.*, 69: 528-29.
- Sonika Sharma (2006). Soil Moisture Estimation using Active and Passive Microwave Remote Sensing Techniques. Indian Institute of Remote Sensing, National Remote Sensing Agency (NRSA).
- Sudhanshu, S. P., Gerrit, H. & Joel, O. P. (2010). Remote Sensing and Geospatial Technological Applications for Site-specific Management of Fruit and Nut Crops: A Review. *Remote Sensing* 2:1973-1997. doi:10.3390/rs2081973.
- Tauhidur, M. R., Adel S. A., & Golam, M. M. (2017). Modeling Future Land Cover Changes and Their Effects on the Land Surface Temperatures in the Saudi Arabian Eastern Coastal City of Dammam.
- Yadav A. K. (2016). *Organic Agriculture (Concept, Scenario, Principals and Practices)*. Department of Agriculture and Cooperation, Ministry of Agriculture, Govt of India, CGO-II, Kamla Nehru Nagar Ghaziabad, 201 001, Uttar Pradesh.
- Yu, L., Lutterodt, H. & Cheng, Z. (2009). Beneficial health properties of psyllium and approaches to improve its functionality. In: *Advances in Food and Nutrition Research*. Taylor, S. (ed.), 55:193-217.

Online Fertilizer Recommendation System (OFRS) in Bangladesh: Perspectives from the Field

Md. Mossabber Hossain*
Md Sazzadul Alam**

Abstract: Bangladesh is well-known for its agrarian social structure; it faces enormous challenges as the quality of land is deteriorating due to the degradation of soil fertility (e.g. nutrient imbalance). Intensive land use for high yielding crop farming without appropriate soil management has caused depletion of soil fertility in Bangladesh. For maintaining soil quality, it is required to follow fertilizers recommendation which is possible by knowing actual situation of soil physical condition through soil testing. Soil test and subsequent fertilizer recommendation were pioneered and provided to farmers via online by SRDI under a2i service innovation fund¹. This article critically reviews the impact, effectiveness, and challenges of digital fertilizer recommendation system from rural farmers perspective.

Introduction

Bangladesh is a country in South Asian territory. It's a overpopulated country, with 60% of total population and 48% of the entire labour force depend on agriculture (Huq & Shoaib, 2013). The whole country divided into 30 Agro-Ecological Zones (AEZ) and many subzones based on soil type and variation in microclimate. Every zone has a different cropping pattern (Huq & Shoaib, 2013). Traditionally Bangladesh is known as an agrarian society-based country, and almost half of the labour force is engaged in this sector. The performance of agriculture sector has an overwhelming impact on the economy, particularly in employment generation, poverty alleviation and ensuring food security. Traditional farming system is often practiced here. But, this subsistence based system has gradually shifted to intensified cropping system (Rasul & Thapa, 2003). However, the diversity and regional difference is the characteristics of agricultural production in Bangladesh, different field has different soil nutrients, and planting and fertilizer application also has obvious personality differences. So, Soil is the vital part of an agricultural system and good soil quality is necessary for agricultural productivity. Inorganic fertilizer had been introduced in Bangladesh during early 1950's, the use of inorganic fertilizer increases by many folds after 1990's (Annonomous, 2012; FRG, 2012).

For maintaining of soil quality for having a good yield, proper fertilizer usage is a necessity which is possible by knowing actual condition of soil by physical examination. Soil test is an imperative tool for assessing the fertilizer requirement for sustainable production of crops and for sustaining soil fertility. Soil test and subsequent fertilizer recommendation was pioneered and provided to farmers by the Soil Resource Development Institute (SRDI), Ministry of Agriculture, Bangladesh. SRDI is conducting

* Assistant Professor, Department of Anthropology, Jahangirnagar University, Savar, Dhaka.
Email: mossabber@juniv.edu

** Assistant Professor, Department of Anthropology, Jahangirnagar University, Savar, Dhaka.
Email: sazzadul@juniv.edu

¹ This research is financially supported by a2i.

soil sample analysis in static and mobile laboratories and then it is provided at farmer's level. Therefore, in the actual fertilization practice farmers use fertilizer depending on availability during the cropping season, fertilizer price, fertilizer dealer motivation & promotion, assumptions and traditional practices in a locality.

A timely recommendation of fertilizer based on soil quality is important to get maximum benefit for overall food production. So, it has long been felt the necessity of an efficient and effective fertilizer recommendation system for better agricultural production. In this context, Soil Resource Development Institute (SRDI), in collaboration with Katalyst, has undertaken a project to develop online fertilizer recommendation system (OFRS) since 2009. As a part of the project, SRDI sought fund from SIF of a2i programme for completing the task of Automation of Data Processing and Data Updating under OFRS. Considering the importance of the project and innovations involved it, a2i programme of Prime Minister's Office awarded the fund to SRDI.

To understand rural farmers intent, we will divide our discussion into four parts except introduction and conclusion. In the second portion we explain a brief history about Online Fertilizer Recommendation System (OFRS), after that we will discuss some literatures regarding the process of agricultural research along with some anthropological works, next we will elaborate our research methodology and lastly we will represent the impact, effectiveness and challenges of digital fertilizer recommendation system from users point of view.

A brief account on Online Fertilizer Recommendation System

SRDI provides soil testing service in their different Regional Soil Testing Laboratory throughout the country and Central Laboratory, Dhaka, Bangladesh. Farmers, students, research organizations, university departments, non-government organizations etc. suppose to collect soil samples following a standard soil sampling technique and submit soil samples for testing in static laboratory. Staff in the laboratory process and test a soil sample for its fertility status. FRC with nutrient status and cropping pattern based recommendation is prepared within few weeks after drying and soil analysis. Fees are set by the govt. for soil analytical results report and or fertilizer recommendation card such as fee in case of a farmer is nominal (about 63 taka). This is most effective tool for location specific and yield goal basis fertilizer recommendation. Therefore, rural farmers hardly use it due to lack of awareness, narrow access of farmers to soil testing facility and inadequate motivation by extension people.

To make it more user-friendly, SRDI started developing Online Fertilizer Recommendation System (OFRS) since 2009 by providing the information of 30 upazillas for testing purpose. On 29 April 2014, the institution expanded the services for the entire country. This software has received several awards for its usability at farmer and local level. Under the system, the method of data updating was partly managed by manual system and partly managed by automated method. For example, soil samples collected from the field are to be sent to the laboratory for analysis. Soil sample analysis results are then to be sent to the concerned scientist and later location-based information is updated online. The address of the website for having online fertilizer recommendation is www.frs-bd.com. Everyone can check the fertilizer recommendation service and obtain FRC after fill-in of some basic information about location, land type, crops and farmer

details. SRDI is updating OFRS with updated UpazilaNirdeshika soil data, adding new features and new data sets on regular basis. Farmers can get online fertilizer recommendation (soil test based) through the service. In addition, farmers can also get information by using a hotline through Banglalink mobile operator at 7676 or from Community Information Center (CIC) of Grameenphone mobile operator.

Theoretical Perspective

Agricultural Research are largely catered and dictated by agronomists and biologists for a long time (Sarker, N. 2017). Change began slowly from 1970s, some anthropologist started suggesting that agricultural research should both begin and end with the farmer instead of the top-down approaches that prevailed at the time (Doddagoudra, S., Kulkarni, R. et al. 2017). Rhoades and Booth (1982) called their model 'farmer back to farmer', which quickly became an early and popular participatory approach in agricultural development, leading to the formation of farmer centered approach.

Participation in agricultural research draws on two broad sources: Firstly, it was preceded by a move towards participation in social science research, motivated by concern that conventional quantitative and neutral research methods tended to preserve social inequality. Its features included problem orientation, a respect for people's capability to produce and analyse knowledge, the researchers' commitment to and involvement with the community, the rejection of 'value neutrality' and the recognition that research is an educational process for researcher and community. The second source is more scientific, on which farmer participatory research (FPR) draws is Farming Systems Research (FSR), where a vast body of technical knowledge has accumulated in institutions and, for problems to be solved and opportunities exploited efficiently, which is lately criticized by Chambers and Jiggins (1986). According to them in FSR, multi-disciplinary collaboration has proven problematic, FSR being resented by natural scientists as a social science innovation; FSR is still dominated by a transfer-of-technology approach; scientists are inadequately prepared for face-to-face dialogue with farmers. Their approaches, attitudes and reward systems need to be 'reversed' if they are to learn from farmers. Chambers proposed more farmer centered action research. The main features of farmer centered participatory research is Learning from farmers is a piecemeal, fragmented and iterative process requiring repeated interaction between researcher and farmer over an extended period. An attitude of honest curiosity on the part of the researcher will generate confidence among farmers to react openly and frankly to what they see. The researcher stands to gain an understanding of the role of the technology he is introducing within the frequently complex farming systems, and an insight into how farmers might adapt the technology. Farmers stand to benefit from technology more adequately tailored to the 'recommendation domain' of which they form a part. From this standpoint, the Evaluation study focused on the farmers point of view from participatory view-point.

The recent progression and Green Revolution (approx. between the 1990s-2010s) in agriculture of Bangladesh resulted in an increase of total production despite yield-gap to ensure food security. But agriculture in Bangladesh is still backed up by higher use of inputs (agrochemicals-fertilizers, pesticides; modern varieties, irrigation etc.) and inversion tillage. This conventional agrochemical based smallholder agriculture may lead to soil and environmental degradation, soil acidification, and a decline in soil fertility.

Therefore, it is significant to optimize input application in intensive agriculture, especially fertilizers. Considering this, SRDI initiated OFRS system in pilot basis. This paper evaluates the potential online facilities of generating online fertilizer recommendations for smallholder farmers in Bangladesh, using 'back to farmer' participatory conceptual framework.

Research Methodology

The study is intended to present the impact of "Online Fertilizer Recommendation: Automation of data processing and data updating" project. The impact study assess the credibility, challenges and areas of improvement of this new service based on relevant stakeholder's experiences includes beneficiaries, environment experts, SRDI officials, Ministry of Agricultural officials and project focal. The evaluation team selected Mymensingh District as data collection site for the purpose of this study. The team conducted quantitative survey with OFR service takers, program staffs and concerned government officials. Study team purposively selected forty respondent for data collection. A2i helped to choose these informant. Along with questionnaire survey, the study team also conducted in-depth interviews (IDI) with service providers Key Informant Interviews (KII) with respective focal persons in the SRDI also were conducted.

Stakeholders' view on the project

This study found most of the farmers who completed primary to secondary level education system are all familiar with digital issues. They mostly use social media like Facebook, IMO etc. All of them have personal mobile phones. But for the SRDI the farmers need to use Android phones or Tab or computers. Not everyone has a computer. And not everyone has an Android phone, but they do not even know the use of Android phones, though their family members own. However, in many cases we have found that the respondents still use the manual method for fertilizer use.

Here there are 39 respondents who have different occupations but they have agricultural land where they use chemical fertilizers and organic fertilizers in agriculture, which is 92.86 percent of the total number of respondents. Two respondents were UDC's computer operators in the profession; they were not involved in agricultural activities due to their occupation. Therefore, they are not involved in the use of fertilizers. As a computer operator of UDC, they are one of the leading stock holders of the service providers from the Soil Marketing Company of Soil Science Institute; they are to keep all the information related to fertilizer use. And in the rural areas, peasants have access to the Internet and related services received from the Internet. But two of them do not know anything about the computer operator's computer operating system in the UDC. The other knows about this, but no farmer has been ever given this service to anyone because the farmers do not come to take service from him. He said that nowadays farmers will come to us with a lot of expertise in agricultural work, why they know very well how much fertilization will be required in any crop. One responder was a woman who could not give us any idea about fertilizer application on land.

From above graphs it shows that the knowledge of the most fertilizer use is obtained from the agricultural information center. Especially from the Union level sub-Assistant

Agriculture Officer. And then there are also upazila agricultural offices. Only one responder has learned from SRDI, farmers know it from the officers working at union and ward levels are given more ideas about the amount of fertilizers to be given on the land and what fertilizers should be provided in the crop. Calling on the mobile operator, especially from the agricultural information service centre, only one person has received this service. Only four respondents have been informed about this information from their neighbors who have been involved with long-term agricultural work. But to get an idea about fertilizer use, there was no farmer who went to the UDC. There are also three farmers who do not have any idea about fertilizer but use fertilizers in their cropping field.

Here among the 42 respondents, 16 respondents know that agricultural information is available online or through the Internet. They also know that agricultural consultation is available for agricultural purposes. The percentage of which is 38.1 percent. Golam Mostafa, a farmer of Ghagra union, said,

"They know about this, but have taken any kind of advice from online. I know that the use of fertilizer-related rules on the Internet is available 1-2 years ago, but I do not want to look for it on the internet. I did not call he said. He will not even need to read since his father's grandfather and ancestors were peasants. They did not use the internet. Did they not work in agriculture? Why do I need to know it from online? Using fertilizer is not a problem, I do farm work, but why should I look for the internet to learn about it? When I needed I went to the convenient store where I can get useful advice from the store, asking what was the use of fertilizer, how much of a handful, after which I gave the shopkeeper information and problems properly. Besides, Rashid Saheb (Agriculture Officer) of our Union, he gives all the suggestions. If all of the people of our union need to go to him, or calling him we can get help about the problem. "

Here, we got 26 peoples' answer. They did not know about the OFRS. Almost four of them uneducated people cannot run Android phones or the Internet.

Out of 42 respondents, only four respondents got information about who knows about OFRS and searched for fertilizer records online and used fertilizers accordingly. However, it was only 19.05 percent of total respondents but 34 respondents did not use OFSR. In this case, farmer Mostafa said the government is doing all the things digital and it is well. We know that it is a good thing to know about fertilizer from online. Now people will know about the proper use of fertilizers in the field and at the right time. Time will take less time. But one thing seems a little difficult for me, that all people cannot run the Internet, and everyone else has not an Android smart phone that will use this method. In Boyra union an entrepreneur Rezaul Karim said that he knew about OFRS 5-6 months ago. A training was organized from the Upazila Agricultural Office in the Vidyaniketan School with aiming to use of fertilizer and pesticides etc. Kamrul Hasan, the entrepreneur of UDC in Charishwardia Union, said that-

` I got a website name from where I can learn about the OFRS website, but I do not remember the address of the website now. The farmers did not come to us for fertilizer service; they would actually like to serve us. I know about fertilizer recommendations and guidelines online but have never used such websites. No

one else came to me about this. At that time, when we asked him to enter the website, he did it and he was very happy because he got information easily. But he advised that if the SAAO had a tab, it had been better to provide the service and the officer can go to the farmers' home and inform about this service because the peasants have more contact with him.

we see that 8 respondents took the service of fertilizer online, none of them received Soil Research Institute and since it was inside the city, many people did not hear the name of the two, they just took service from UDC. Only two respondents got two services from Agriculture Information Service, three people got service from the Upazila Agriculture Office and one through mobile and one from the neighboring service. But here, two people have got information from multiple sources, such as a farmer named Jaynul, has received this service through mobile and from UDC and information from an informant named Abdul Halim and a neighboring agricultural office. Another respondent also accepted this kind of service from Mymensingh Agricultural University.

In these areas, people travel from one place to another in their own areas through the main transport vehicle Auto rickshaw. There are also motorcycles, rickshaws, CNG vehicles, engine driven van and other. In many cases, because of the disruption of the transport system and the service center is near their place of residence, they travel on foot.

Team interviewed a total of 42 respondents. Of these, two respondents were women. They did not go to any fertilizer shop or market for fertilizer consultation. So they did not spend time to get this service. For this reason, we have tried to analyze this time with 40 respondents. It took time to get the service of 20 respondents to 30 minutes or less. Because of this, they said that they are usually required to accept fertilizer recommendation from the service centers which are required from the local market, their union or the SAAO of their respective wards, and if necessary, then the upazila agricultural office will be required. And because of the easy access to these areas, they can do their jobs by reasonable time. Because of the mobile phones is in their hands, they took the advice of any kind of agricultural advice by calling their respective union's SAAO. The interviewer got two informants who received the advice about agriculture by calling 16123.

There were two women informants who were never referred for taking this advice. Most of the people who were referred were approaching the SAAO and contacted the upazila agricultural office. And 24 respondents were not referred anywhere. But people here are especially located in the Boyra Union and close to Bangladesh Agricultural University some people of this union have been employed in the agricultural universities, they discuss any problem related to agriculture, with the teachers of the university and they accept the advice accordingly. SAAO Habibullah of Boyra Union said that-

' we have received a few suggestions for the peasant consultation and because of the university; they accept the advice from the university. '

However, those who do not work in the university sometimes consult with us and we consult them. Again they occasionally consult neighbors too.

Study did not find any reply that has spent extra money to get agricultural information or service. It is well known to every SAAO and farmers concerned in the union. A person belonging to a farmer has their own SAAO and phone number in their area, but if they need additional information, then they contacted with the upazila agricultural office. But they never went to the SRDI office. They did not hear the name of the SRDI. In this regard, Rezaul Karim said-

"If we can solve our problems by our nearest agricultural officers and by calling them on 16123 through mobile, then why would we go to the Soil Research Office in the district town, far from our area."

A respondent of Baraishwardia said-

"The digital system goes to very low cost and fast but it has complexity. The complexity is that everyone cannot use it. I would have to learn how to use them. Besides, we need to learn how to use mobile, internet, and computers."

Do those who do not have adequate education, can they use it properly? Anyway, the replies of the respondents we have received is presented below-

Here study found 'Yes' indicator responder 33 people and it is 79% of total respondents. And 'No' indicative answer has been received by three people whose percentage is 7.14% and 'No idea' such number of respondents six people. The percentage of which is 14.29 percent.

Golam Mostafa of Ghagra Union said that the digital system is different from the previous manual system. But the use of the Internet is making life easy when the simpler and satisfying digital method of digital mode has made life easier. But it needs to spread through a lot of publicity. The advertisement spreads in the public when people learn how to use it will become more effective.

Three respondents spoke of the complexity of the digital system, among them Saiful Islam, 57 years of age, who has not sufficient knowledge, he can use on mobile and said-

"Calling on mobile is easy, we can communicate in a very short time, but online through internet instructions for fertilizer use are difficult, I cannot read and use the internet. I do not have proper education then how to get this service. The government is providing internet so that we get all kinds of information. It is good but I do not see any difference between good and bad. I use the experience with the fertilizer that I use in the field of agriculture. It is more important to me that the digital system in that sense is very much complex, manual method is a lot easier."

Abu Hossain, 60, and Abdur Rashid, 45, both said in group discussion that-

"we did not use the digital method, so we do not compare and assess how does it work and its benefit, but it is not easy to get the time to do so. However, though I did not use, I think it is easier and it must be beneficial for the farmers as Government is prioritizing it."

Saiful Islam 55, said-

"I think it is easy, so government is giving importance on digital method."

The Soil Research Institute of Bangladesh SRDI is working on making an online-based instruction on how much fertilizer should be used on the land depending on soil structure and crop varieties. Since 2009, it started the project in 30 upazilas in the beginning of 2014. The program expanded, and the number of online-based services reached the level in nine years is yet another comparative images are illustrated below -

About half of the respondents we interviewed (52.38 percent) are not aware of the online fertilizer guidelines, because of their digital complexity or because of the online access limitations and nobody is aware of this due to complete ignorance but the rest (47.62 percent) the respondent knows in some way that nobody used to use it after its trial, but those who are aware nine among the respondents having knowledge of 1-6 month, know that 4 respondents have learned about 7-12 months from 1 year to 1.5 years, four respondent have knowledge and the number of respondents who know for more than 1.5 years. We saw from above three of these data that the number is increasing in recent times, that is, with time people have been aware of it and have it gradually.

Survey found the main source of information are- Upazila Agriculture Officer Union, SAA, Agriculture Information Service, Television, Mobile Operator, UDC, neighbors and the latest from us, that we have found that fertilizer instructions for online agriculture work are available

This project process has made money easy, if the internet access is speedy and the website is known, then there is a comprehensive service related to fertilizer instruction. In this regard, digital farmers of the agricultural sector have expressed their appreciation that the harassment of the digital system is less and the service can be taken from anywhere in the world. I can see that 18 respondents say that this project is very simple and it will be easier farming. In this context, Boyra union's UDC entrepreneur Rezaul Karim said it is not beneficial for everyone though. It's needed to keep pace with the time. In the manual method, many people were hurt due to unapproved knowledge from the local superstition, but there was no scope to get bad intelligence online. But uneducated farmers cannot use online service. It is a problem that it has been digitized, it would have been good if it used to be in the audio service. If the farmer could compute the quantity of his land and other instructions in the audio command and would get it in the feedback or the answer audio format then it would have been easier. Even uneducated farmers could use it. Ten respondents did not give any opinion. They do not know much about this. 14 respondents could not agree on this. According to them, it is not useful for everyone because the pre-condition is to use an Android mobile phone or a computer to take an internet connection as well as to know that only a person can get direct service from it. But in our country the smart phone is not in the hands of the computer. Internet connectivity is very difficult to get in villages. So we can say that this process is easy for those who are educated farmers and those who have internet. In this case, it is easily available to them in a manual way and easy process.

Is it less time consuming?

According to 23 respondents, it takes less time for 15 respondents to agree or disagree. Four respondents are disagreed with this. Kamrul Hassan of Chariswaria said-

"We are getting all the information in a single click. So how will it take more time? Why not it is very easy, but sometimes it does not have internet. It cannot be used and manual method does not require internet. We can take help from neighbors and it is easy."

Ramjan Ali of Paranganj said that-

'The use of the fertilizer in the digital system is very accurate, it is mentioned that the correct amount of fertilizers is allocated in this field and it will also be good for the crop and there is no damage to the land.'

Does OFRS easy and accessible?

Here, 19 respondents said it is very easy to use and anyone can use it according to capacity, but 10 respondents did not make comment on this. Among them, Mansur Ahmed said that

'Since we have not used it and I have not heard it before, I cannot even say that it is easy to use.'

13 respondents disagreed with this among them. Among them, AbdusSattar (60), a farmer, has a family number of 12 but his son and daughter study in Dhaka only use smart phones and they come home during various festivals. There is a Nokia old model button phone with it can only talk but running the internet. He is the ideal farmer of his village; he accepts all the consultation related to fertilizer from his respective Union SAAO. And he is a very old farmer who has many experience in his agricultural work, he uses his experience in using fertilizer. He cannot use the Internet. He said-

'The government is doing everything digitally good but we cannot use the digital service that is being used for the use of fertilizer because we cannot use internet so we can say that it is easy and inspirational for educated people. But it is equally very difficult for the uneducated people to use.'

Complain response system are established

The number of respondents who received the response process was only three, 27 respondents did not make any comment on this. According to AbdusSattar, they have not faced any kind of problems since they did not use online service. 13 of the total respondents disagreed with the service, they told that the online service in Boyra Union has huge problems and it is not updated regularly. in his word-

'Once I browse, I do not see the name of our Boyra union in the site even. In this case, we need to follow the manual method.'

Study found Lokman Hossain, a farmer of the Boyra Union critical on OFRS, he said-

'Here some of the information has been provided. Few information is organised in the site haphazardly as a river Shailamari has passed by Boyra union under Mymensingh municipality and so on. Garbage of Mymensingh Medical College Hospital is thrown in the river. In addition, the waste products of Mymensingh city are placed here. As a result, the water of the river has become contaminated, its water is now very dirty. The river water contains huge amount of nitrogen. The low land of this area mostly is submerged in the water and if we cultivate rice in the season we do not need to apply fertilizer. The production is good, but sometimes the land is flooded and paddy fields are destroyed. But if we want fertilizer guidelines to go to this website, then the advice comes as use of urea fertilizer application but the urea fertilizer will not be applicable for this kind of land. That's why I said that it is not better idea to get right advice for all from this website.'

Staffs are speedy and query handling

Most of the Respondents said they wish to have a service by which farmers themselves can also use it by themselves alongside they will go to the local digital center for the service. But the local center of the local union does not have full time internet connection and the speed of the internet is not satisfactory. Many of the UDC entrepreneur do not know the useful fertilizer recommendations. Although the entrepreneurs are trained in this field, the farmers are less knowledgeable about the online fertilizer guidelines, they know very little about it. Because of this, they do not go to the UDC entrepreneurs regularly because their low quality services. Study found many entrepreneurs who do not know about this service, but there is a huge signboard outside their office room, where there is written that online fertilizer instructions are available there. In this case, eight respondents agree that the staff provides efficient and quick service. Seven respondents did not make any comment and the remaining 17 respondents could not agree with it. SAAO of Charishwardia said that since we have direct contact with the farmers, it is more possible to promote our campaign. In this case, if anyone is sufficiently trained in this regard and is provided a Tab, then we can go to different remote areas and educate the farmers in this regard, and we will also be able to advise the farmers about the instructions. In this case, if there is any option to update the information, Agriculture and various information can be updated here so that the website will be updated by maintaining a liaison at the field level through SRDI upazila agriculture officer which will be able to implement it.

a2i support should continue for further development of the project

Here 35 respondents said that a2i needs support because this project is a very good initiative of the government, it saves earth and increases agricultural production. a2i project helps to make a digitalize agricultural system. Now-a-days farmers can get the right suggestions on right time. website has some shortcomings such as some information on the project website needs to be updated regularly. For example, some areas or union names are not connected here, also soil samples of all the union are not available, with the further help of a2i SRDI can take initiative for that. Besides, there are varieties of crops that are produced here it should be added effectively. Four people did not give any opinion and three of them disagreed.

The project will sustainable without SRDI support

Only seven respondents said that this project would be sustainable without the help of SRDI. 30 respondents did not give any opinion about this. Five respondents disagreed with it. Many respondents did not hear the name of SRDI, and when they were told that it is the government's soil research institute, it is a scientific method. Many people say that this is a good initiative, but many of us do not know much about this project as this project has a very low expansion. As long as everyone knows about it, the institution should work in it till everyone knows about it, and if everyone can enjoy its benefits then all farmers will use it, then without help from SRDI this service could be sustainable. However, the government should run its campaign through the SRDI and the Upazila Agriculture Officer, especially on television by placing big signboards, telecasting ad with the TV in different markets in the market where huge people gather. In this way people will be able to know about this website with the help of projector at the open place

of the hats, and it will spread to the public rapidly. It will spread on the respective field level and make it public.

The overall outcome of the project is satisfactory

According to 18 respondents, it is satisfactory service. 14 people did not give any opinion on this regard and 10 respondents differed in this issue of assessment. If the stakeholders are aware of this service it will succeed. Russell Mia said that –

'The result of this is a2i is satisfactory, especially I am happy with it once I planted maize. Last year, I gave a phone call to SAAO and I realised that his phone was switched off and later I asked for advice from an experienced senior citizen who could not help me regarding my problem. I have a habit of running the Internet again. I searched the net and found out the solution from the known website and it was very easy for me to know as I am familiar with handling internet. I can understand that it is very easy for me but those who cannot run the internet, especially those who do not know the education, they will not understand it. Though it is available to use fertilizer, it would have been more useful if this website could run without any internet charges. Also, if there is an audio input system for those who are not educated properly, then everyone could use it. The government's digital system is good in agriculture but it will have to be promoted more to make it more productive.'

Conclusion

The precise finding of this study is that the implementation process of the project is going well and it has already proved its effectiveness in providing services in more user-friendly and time saving way. Through survey, field visit and interviews, we get this clear impression that the web based application has made the process easier than before. As stated earlier SRDI, in collaboration with KATALYST, has recently developed an Online Fertilizer Recommendation System to generate location specific fertilizer recommendation for selected crops analyzing national nutrient database (using semi-detailed soil survey data) developed by SRDI. This web-based online fertilizer recommendation service is now available to farmers through digital technology. By inputting some basic data, such as Upazila/district, types of crop and land area, a farmer can get a prescription about what types of fertilizers are needed for his/her crop land.

As a pilot project the system was successful; this present study has been conducted to assess the impact of this project. The contribution of the project to the overall OFRS is noteworthy as it makes the whole system automated. Farmers and other stakeholders mentioned that they found the service very useful and it would contribute to increased agricultural production as well as food security of the country. The major weaknesses relate to the lack of SRDI Staffs; inadequacy of resources; and failure to make a country level online coverage and proper campaign. To strengthen the current OFRS system in the country, therefore, investment in training and continuing professional development in OFRS for different stakeholders is needed.

References

- Annonomous. (2012). Fertilize recommendation guide. Bangladesh Agricultural Research Council. Dhaka
- Bangladesh: Access to Information (2020). Evaluation (online), Available at http://a2i.pmo.gov.bd/sites/default/files/resource_docs/a2i%20Evaluation%20Report.pdf
- Doddagoudra, S., Kulkarni, R. &Gubbi, M. (2017). *An Introduction to Agricultural Anthropology*, 5(1): 144-147.
- Escobar, A. (1999). Beyond Nature: Steps to an Anti-Essentialist Political Ecology. *Current Anthropology*, 40(1): 1-30.
- FRG, (2012). Fertilizer Recommendation Guide, Bangladesh Agricultural Research Council (BARC), Farmgate, Dhaka 1215, pp275.
- Huq, S. I., & Shoaib, J. M. (2013). The Soils of Bangladesh (Vol. 1): *Springer*. <http://dx.doi.org/10.1007/978-94-007-1128-0>
- Jahiruddin, M., Islam, M., & Miah, M. M. (2009). Constraints of farmers' access to fertilizer for food production. Final Report. National Food Policy Capacity Strengthening Programme. FAO. Dhaka.
- Price, L.L. &Palis, F.G. (2016). Bringing Farmer Knowledge and Learning into Agricultural Research: How AgriculturalAnthropologists Transformed Strategic Research at the International Rice Research Institute, *Culture, Agriculture, Foodand Environment*, 38(2):123-130.
- Rasul, G., & Thapa, G. B. (2003). Shifting Cultivation in the Mountains of South and Southeast Asia: Regional Patterns and Factors Influencing the Change. *Land Degradation & Development*, 14, 495-508.
- Rhoades, R. E., & Booth, R. H. (1982). Farmer-Back to-Farmer: A Model for Generating Acceptable Agricultural Technology. *Agricultural Administration*, 11: 127-137.
- Rhoades, R. E. (2005). Agricultural Anthropology. *In Applied Anthropology: Domains of Application*. S. Kedia and J. V. Willigen, eds. Pp. 61-83. Westport, CT: Praegar
- Sarker, M. N. I. (2016). Knowledge, Adoption and Constraint analysis of Chilli Technology in Char Area of Bangladesh. *International Journal of Ecology and Development Research*, 1(1): 16-18.
- Veteto, J. R., & Crane, T. (2014). Tending the Field: Special Issue on Agricultural Anthropology and Robert E. Rhoades. *Culture,Agriculture, Food and Environment*, 36(1): 1-3.

Incorporating E-governance to Civil Service Training of Bangladesh: Obstacles and Recommendations

Jebunnessa^{*}
M. M. Ashaduzzaman Nour^{**}

Abstract: This paper uses primary data as well as expert opinion to identify obstacles of the current state of training on e-governance conducted at the Bangladesh Public Administration Training Center; the apex training center in the public sector. Training on ICT is considered to be an important instrument in launching e-governance. The strengths are availability of computer lab with internet facility and the friendly training environment that plays a positive role in awareness building. The weaknesses are inadequate curriculum and lack of demonstration on application of case studies in public administration. The study also manifests a few logistical problems that include lack of adequate number of trainers in demonstration classes and the poor speed of connectivity that reduces the effectiveness of the demonstration classes. Based on empirical findings, this paper suggests recommendations to meet deficiencies through designing of a stepwise training module for a breakthrough in this time driven gesture.

Keywords: E-Governance, G2C, G2G, G2B, LAN, WAN.

1. Introduction

E-governance now a buzzword in the domain of public administration stands for electronic governance which means buying government multifarious services on line. This includes among others paying taxes, purchasing licenses; sharing information among various organizations including governments beyond national borders. The idea embodies use of Information Communication Technologies (ICT) to steer government activities in a more accessible ways to various clientele groups. The interface thus includes various stakeholders such as government, citizens, corporate world and above all a mode of communication that is transparent, efficient, time saving and cost effective. The interface among these various units is important for a coordinated effort to reach a common goal and “government is the subset in the process that acts with authority and creates formal obligations” (Keohane and Nye, 2000). E-governance can circulate information with electronic means regarding rural development process (Bertot, Jaeger and Grimes, 2010). Dawes, Vidiasova and Parkhimovich (2016) emphasized on better communication between government and people in this regard. Elkadi (2013) explains that administrative processes have to be reinvented to provide better rural development service digitally. Electronic signatures are necessary to enable legal transfer of rural development services by digital means in both personalized and customized way (Mirchandani, Johnson and Joshi, 2008). It is also important to integrate information systems properly to get service from a single computer-generated center. This single cybernetic center can become the prime contact point for all rural development programmes (Ovais Ahmad, Markkula and Oivo, 2013). According to United Nations (2016), e-governance is a general term for internet and electronic device-based services from local, state and federal civil servants. In this era of e-governance, the public

* Professor, Department of Public Administration, Jahangirnagar University, E-mail: asiranjar@yahoo.com

** Assistant Professor, Department of Public Administration, Bangladesh University of Professionals (BUP), E-mail: nourdu105@gmail.com

agencies use information technology to support administrative actions, involve citizens and provide services efficiently (Sivarajah, Irani and Weerakkody, 2015). Interactions among different actors may be in the system of obtaining information, making payments, online services etc. (Ranerup, Henriksen and Hedman, 2016). To promote greater participation of citizens, political institutions play the major role within the framework of e-governance. Government, citizens, business organizations, interest groups etc. are the main actors in using e-governance. Using e-governance in civil service training can be described as a product of New Public Management (NPM) reform approaches. Administrative machineries in many developing countries including Bangladesh now own websites. These websites provides information but are not updated regularly. Moreover, none of them attains interactive phases in the truest sense. Though e-information criterion meets some requirements in Bangladesh but the e-consultation and e-decision-making are lacking in many respects though currently there are steps for e-consultancy and e-decision making through inter-connectivity among the various government offices. Now the scholars and practitioners feel the urgency to identify the obstacles and way forward for enhancing e-governance in civil service training of Bangladesh.

2. Literature Review and Research Gaps

Ali (2004) describes in his book 'Bangladesh Civil Service' that training is considered as an integral component in the enhancement of professional attributes of civil servants in the various domain of their work. Public sector training institutions primarily impart training to civil officials in Bangladesh. Among the training institutions, Bangladesh Public Administration Training Center (BPATC) caters to the training needs of all the 29 cadres at the entry level and training needs of the mid level and senior level officials of the Bangladesh Civil Service Administration Cadre. Literatures on BPATC and training system of civil service in Bangladesh are available. Khan (2013) mentioned that BPATC has four regional training centers at four divisional headquarters to meet the training needs of Class II and supporting staffs. Currently, the course curriculum of the various courses in BPATC and in the regional centers has undergone a drastic change in contents to facilitate use of ICT; more on computer literacy and language skill than on rules based training, a practice of the past.

BPATC and other training institutes started computer-training program in 1997 through an official order of the Ministry of Establishment [MOE (FT) C-6/97-84]. This training was confined only to theoretical discourse and was not effective because officials did not get hand on experience on ICT in the absence of well-equipped lab with computer and Internet connectivity (Khurshid, 2006). However, computer-training programs for all levels of government officials have undergone a change after 2001 with the installation of well-equipped computer laboratories and incorporation of module on Information and Communication Technology. Now, the Center has Internet facility with broadband connection where officials can browse web page and interact with outside world for information sharing. A one-hour session is earmarked each day for ICT classes through which officials get first hand exposure in ICT (Alam, 2006). BPATC also conducts a four weeks specialized course on Information Technology and e-governance. This course addresses specific requirement of e-governance such as hardware and trouble shooting, data base management, net working and web development. The center already conducted

two such courses during the last two years and trained fifty two participants from various government offices and autonomous bodies on the way to launch e-governance (Karim, 2007).

In 2015, Khan mentioned that a pragmatic assessment of the entire training program on ICT manifests naivety. This training although lacks rigors in application of e-governance and understanding of the fundamentals; nevertheless be considered as a first step towards any initiative of the government in the introduction of e-governance. Indeed, at the entry level most of the officials work at district or Upazila (smaller administrative unit) level. In 2016, Khan mentioned that All the administrative districts and two thirds of the Upazilas in Bangladesh are connected through digital network. Internet connectivity is available in many districts and officials at the entry level are benefited through exposure to training on ICT. They can use the knowledge gained through this training program in their office work.

Senior Level officials mainly work at the secretariat and indeed constitute the first tier in the policy making process. An understanding of the application of ICT is imperative for designing work plan and thus training at BPATC helps awareness building that may work as an incentive for understanding the technologies associated in such a drive. Mid-level officials work both in the secretariat and in the field administration (Rahman, 2009). Training on ICT is useful for those who work in the secretariat where Internet connectivity is available and those who work in field administration as Deputy Commissioners. Entry-level officials (those who work in district headquarters) have access to the Internet facility available in most of the Deputy Commissioner's office (Khan, 2016).

Skimming through the voluminous number of studies in this field, it can be claimed that the benefits of e-governance are substantial for both government and citizens (Janssen and van den Hoven, 2015). The payoffs for government include reducing costs, reaching to a larger portion, faster response, improving organizational image through branding and many more (Gajendra, Xi and Wang, 2012). Yildiz and Saylam (2013) illuminate that digitalized training has necessarily changed the whole process from a paper-based mode to an internet-based more efficient and continuous mode. This process has reduced costs by about 87% compared to traditional methods (Navarra and Cornford, 2012). Rorissa and Demissie (2010) argue that cost-effectiveness and economy can be achieved as it costs less to publish available services on the public agencies' website than any other media. Thus the mounting evidences of e-governance in civil service training benefits have lured many governments across the globe (Guha and Chakrabarti, 2014). The transformation of paper-based to web-based process has been observed in North America, Europe, Asia-Pacific organizations with a revolution. Despite its substantial benefits, relevant literatures also highlight some challenges that include discrimination towards particular groups, threat to privacy, huge number of demands, inequality of access, absence of personal touch and so on (Kim, Kim and Lee, 2009).

Researches were conducted about the impact of e-governance and civil service training in Bangladesh. The state of introducing e-governance in civil service training is an under-researched filed. This realization helps in identifying the gaps in previous research in this connection. The literature review on e-governance and civil service training in Bangladesh states that many scholars have shown their interest in measuring the importance of e-governance and civil service training separately in Bangladesh. However, strategies for enhancing e-governance in civil service training of Bangladesh are not analyzed systematically by empirical research yet.

3. Objectives

The broad objective is to measure the factors of obstacles to incorporate e-governance to civil service training in Bangladesh. The specific objectives are to identify obstacles and find out recommendation. Thus, the purpose of this study is to explore the training strategies of the civil officials; an important ingredient to upgrade the human capital index in e-governance drive.

4. Hypotheses

We conducted this study based on the following hypotheses:

H1: Obstacles of incorporating e-governance to civil service training in Bangladesh are interrelated.

H0: Obstacles of incorporating e-governance to civil service training in Bangladesh are not interrelated.

These hypotheses will help us to find out the factors regarding obstacles of incorporating e-governance to civil service training in Bangladesh.

5. Methodology

This study is based on a survey administered through a questionnaire that includes a set of training related questions in the field of ICT training. Questionnaire included questions on the idea of e-governance, computer literacy, access to computer and Internet facilities. Based on the literature review the following 16 variables are identified to determine the obstacles.

Table 1: Variables of the Study

| Variables | Sources |
|-------------------------------------|---------------------------------|
| lack of knowledge of civil servants | Kim, Kim and Lee, 2009 |
| ignorance civil servants | Guha and Chakrabarti, 2014 |
| less priority of civil servants | Yildiz and Saylam, 2013 |
| financial barrier | Rorissa and Demissie, 2010 |
| technical barrier | Navarra and Cornford, 2012 |
| losing responsibilities | Rorissa and Demissie, 2010 |
| lack of citizen support | Kim, Kim and Lee, 2009 |
| lack of legal regulation | Guha and Chakrabarti, 2014 |
| inability of competition | Rorissa and Demissie, 2010 |
| diversity | Navarra and Cornford, 2012 |
| management costs | Kim, Kim and Lee, 2009 |
| lack of readiness | Guha and Chakrabarti, 2014 |
| economic crisis | Janssen and van den Hoven, 2015 |
| rigid bureaucracy | Rorissa and Demissie, 2010 |
| changes in taxation | Navarra and Cornford, 2012 |
| absence of IT experts | Gajendra, Xi and Wang, 2012 |

The purpose of the survey is to determine the strengths, weaknesses and inadequacies in the existing training programs. The questionnaire also includes queries to garner feedback from the respondents through open ended questions so that challenges can be sorted out and doable within the available resources can be delineated in the transition phase from manual to electronic devices in public sector service delivery.

Primary data were collected on purposive basis from three categories of government officials related to e-governance implementation programs at Bangladesh Public Administration Training Center. Questionnaire was distributed to 22 Senior Level officials, 83 Mid Level officials and 174 Entry-Level officials. Though sample size constitutes less than 10 percent of the population, nevertheless the feedback may serve as a preliminary guide. The limitation of this study is the absence of any statistical treatment of data; both on descriptive and probabilistic context. The survey design initially did not keep provision for this statistical treatment and the findings are based on just opinion survey.

6. Quantitative Results and Findings

To find out the relationship among the obstacles to implement e-governance, we conducted a factor analysis on 16 variables. Those variables about obstacles are lack of knowledge of civil servants, ignorance of civil servants, lesser priority given to civil servants, financial and technical barriers etc.

Table 2: KMO and Bartlett’s Test of major obstacles

| KMO and Bartlett's Test | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .710 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 488.043 |
| | Df | 120 |
| | Sig. | .000 |

The variables are interrelated as KMO and Bartlett test result, where null hypothesis of Factor analysis, is rejected because level of significance is .00000 <.05 or .01 (Table-2). Consequently, obstacles involved in implementation of e-governance are interrelated. Based on the interrelation of these obstacles involved in implementation of e-governance, we will able to find out factor.

Table 3: Rotated Component Matrix of Obstacles

Rotated Component Matrix^a

| | Component | | | |
|-------------------------------------|-----------|------|------|------|
| | 1 | 2 | 3 | 4 |
| lack of knowledge of civil servants | | .864 | | |
| ignorance civil servants | | | .832 | |
| less priority of civil servants | .511 | | | |
| financial barrier | | .867 | | |
| technical barrier | | .566 | | |
| losing responsibilities | | .746 | | |
| lack of citizen support | | | .591 | |
| lack of legal regulation | | | | .821 |
| inability of competition | | | | .736 |
| diversity | .736 | | | |
| management costs | | .772 | | |
| lack of readiness | .597 | | | |
| economic crisis | | | .707 | |
| rigid bureaucracy | .834 | | | |
| changes in taxation | .718 | | | |
| absence of IT experts | .686 | | | |

Extraction Method: Principal Component Analysis.

Rotation Method: Quartimax with Kaiser Normalization.

- a. Rotation converged in 7 iterations.

We found four factors; which showed at Rotated Component Matrix. Here component 1 incorporates less priority of civil servants, diversity, lack of readiness, rigid bureaucracy, changes in taxation, and absence of IT experts. Component 2 includes lack of knowledge of civil servants, financial barrier, technical barrier, losing responsibilities, and management costs. Component 3 integrates ignorance civil servants, lack of citizen support, and economic crisis. Finally, lack of legal regulation and inability of competition are assigned under component 4. From this factor analysis, we developed a figure which can be named as 'incorporating e-governance to civil service training in Bangladesh'. This figure is shown below.

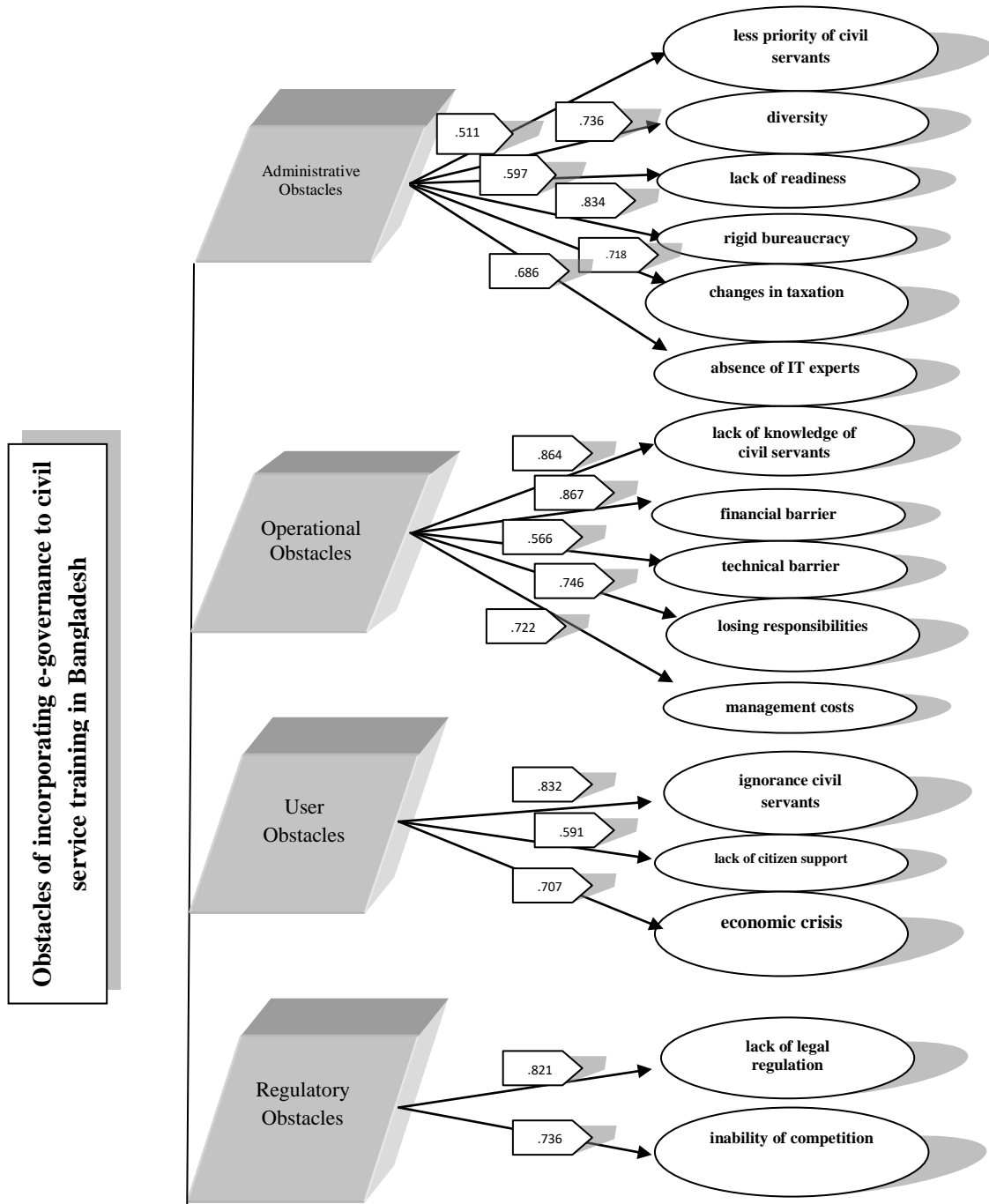


Figure 1: Obstacles of incorporating e-governance

Based on the nature of variables, we can assign a name to each component. Here, component 1, 2, 3 and 4 are named as administrative obstacles, operational obstacles; user obstacles and regulatory obstacles respectively. Thus, we can say that there are four

factors, named as administrative obstacle, operational obstacles; user obstacles and regulatory obstacles involved in incorporating e-governance to civil service training in Bangladesh.

Among these factors, the first factor known as administrative obstacle incorporates less priority of civil servants, diversity, lack of readiness, rigid bureaucracy, changes in taxation, and presence of IT experts. Among those regulatory obstacles, rigid bureaucracy is the most important variable according to its points in Rotated Component Matrix. The next variables are diversify, changes in taxation, presence of IT experts, lack of readiness and less priority of civil servants are comparatively more important.

The second factor known as operation obstacle incorporates lack of knowledge of civil servants, financial barrier, technical barrier, losing responsibilities, and management costs. According to its points in Rotated Component Matrix, financial barrier and lack of knowledge of civil servants are the most important variables. The next highest rated variables of the second component are management costs and losing responsibilities. Additionally, technical barrier is also comparatively important.

The second factor is user obstacle which includes ignorance civil servants, lack of citizen support, and economic crisis. According to its points in Rotated Component Matrix, ignorance civil servant is the most important variable. Economic crisis and citizen support are comparatively more important variables.

The last factor which is known as regulatory obstacles includes legal regulation and inability of competition. According to its points in the Rotated Component Matrix, lack of legal regulation is the most important variable. Then inability of competition takes its place.

7. Qualitative Findings and Analysis

As a prelude to the training strategy on e-governance, participants were asked to elaborate their understanding on the concept of e-governance and the role of training on awareness building. The purpose was to get some feedback on the basic concept, their perception and doable in this area.

7.1 Idea on E-Governance and Role of Training on Awareness Building

The participant has the basic understanding on e-governance as mechanism to provide government services to citizens (G2C). Most of the senior level officials understand the basic idea that it embodies buying or receiving government services on line. The response from the mid level and entry level are respectively 48 percent and 37 percent respectively. The findings transpires that officials working in secretariat and important locations in administration such as Divisional and District level administrative units possess idea on e-governance's various mode such as Government to Citizen (G2C), Government to Government (G2G) and Government to Business (G2B). Though the response from senior level officials on the other mode such as G2G and G2B are more than 50 percent, the response from mid and entry level officials indicates lack of understanding on the other mode of e-governance. This is a reflection of poor exposure of the officials in field administration and brings the issue of digital divide between the field administration and the secretariat environment. Access to information is an important

pillar in administrative ethics. e-governance through e-information and e-consultation may work as a tool in reducing corruption through transparency in all government transactions. The response from senior level officials is encouraging (68 percent), but the response from mid and entry level officials is again a reflection of the inaccessibility of the electronic devices in field administration and thus the utility of the devices in reducing corruption. On the role of training in awareness building on e-governance, participant's response was rather scanty. Only one third of the participants from entry level, 49 percent from mid level and 41 percent from senior level responded positively. Only a few acknowledge that training plays a positive role in awareness building and thus have limited impacts. Though mere possession of a computer is not e-governance but it is true that e-governance refers to the re-engineering of government various services through Internet and web page, where knowledge on computer fundamentals is a prerequisite. Therefore, ownership and access to a computer is a prerequisite even in a modest endeavor. Another important element is the connectivity and presence of Web page for information sharing.

7.2 State of Inventory and ICT access

The finding reveals the preparedness at the ministry level for e-governance initiative in two important areas; internet connectivity and on web page availability for information dissemination. Over 100 percent Senior Level, 97 percent Mid Level and 90 percent Entry Level officials has computer access in office, 100 percent senior level officials have Internet connection in office and 100 percent has official Web Pages. Many Entry-level officials work in remote Upazilla and obviously lack Internet facility. Only 65 percent of entry level officials has access to computer in office and has internet connection. These micro findings may be compared to macro findings initiated by the Support to ICT Task Force, a unit of government to implement government policy on E-governance. To narrate a few macro statistic from the latest available survey, for every 100 employees there are 98 PCs available at the Ministry/Division level and more than 95 percent of the government offices at the level of ministry/ division/ department/ corporation have dial-up Internet connection, about 10 percent have broadband, while less than 5 percent have radio-link connectivity and at the Ministry/ Division level, about 40 percent have LAN. Computer literacy is one of the important elements for a successful drive in E-Governance. So, there was a question to test the computer literacy of the participants. Indeed, this question was set with a purpose because use of computer in office work started only late nineties by withdrawal of typewriter. Though, the definition of computer literacy may vary in different environment, this survey considers a person computer literate when he is comfortable in typing and doing regular households chores using a computer and can open, check e-mail and also can post a reply.

7.3 State of Computer Literacy

Most officials are computer literate and on an average, at the senior level 92 percent, 98 percent at the mid level and 100 percent at the entry level are computer literate. This finding bears a close relationship to the previous part and asserts that officials are acquainted to the electronic data communication devices and are also being trained to meet this requirement. Redesigning an existing training curriculum for improvement must incorporate an assessment of the efficacy of the existing program. Therefore, this

survey included questions on the strength and weaknesses of the existing ICT training program so that future program may be designed with contents suitable for e-governance drive. The questions were open ended and there were different responses. To present the findings in a coherent mass, both strengths and weaknesses are grouped into several categories.

7.4 Strengthens and Weaknesses of Existing ICT Training

There are some useful insights on current training program at BPATC on e- governance. On various counts of strengths, 91 percent of senior level, 41 percent mid level and 32 percent entry level officials expressed that though course contents useful for office work but are elementary in nature for e- Governance drive. Over 50 percent mid and senior level officials and 70 percent entry level officials acknowledged a friendly training environment. On LAN facility, the response was mixed. Over 70 percent of the officials though appreciate the availability of LAN, but because of low connectivity the effectiveness of the demonstration sessions need to be compromised. On weaknesses, most respondents expressed the necessity of designing an appropriate curriculum and adequate demonstration sessions on E- Governance. The demonstration sessions often suffers because of lack of trainer. Moreover, poor connectivity and slow browsing speed hampers smooth conduct of demonstration classes and time allotted on ICT training do not adequately meet the needs of the officials. Indeed, the weaknesses as revealed by the participants are genuine and deserve scrutiny. There are three labs each with 60 computers connected through LAN facilities. But four faculties can not address individual needs when the class size is over 50. A one-hour session each day is not enough for practice and proper demonstration. The existing course curriculum contains computer basic such as MS Word, MS Excel, MS Power Point, MS Access, a firsthand knowledge on Internet and e-mail connectivity. There are roughly thirty two one hour sessions for the entry level officials whose course runs for four months, 20 one hour sessions for the senior and mid level officials, both courses run for a period for ten weeks. The survey depicts certain inadequacy of training on e-governance. Nevertheless, as a basic training on ICT in computer literacy and application of Internet and e-mail facility, the success is modest. No doubt, in the absence of any formal training program this program may be regarded as first step in breaking the inertia and inspire the officials to enhance the capacity and help awareness building in the application of e-governance in the service delivery mechanism of the government.

8. Recommendations

Based on the perceptions of the interviewees, the following recommendations have been explored for effective implementation of e-governance in civil service training in Bangladesh.

8.1 Redesigning of Training Program

The survey identifies certain weaknesses in the current training program. Most important are insufficient time allotted in ICT training, banal course curriculum and absence of demonstration on e-governance. These weaknesses may be overcome by revision of ICT course contents, allocation of more time in computer practice and ensuring the

availability of more competent trainers. Indeed, the training on ICT at BPATC equips participants only with basic skills. The course outline given in the following chart manifest the absence of rigor in the program though at least 250 Entry level, 70 Mid level and 50 Senior level officials receive training each year and get the first hand exposure on computer training. Thus the existing Course outline may be enriched through incorporation of topics such as concepts of networking and classification (LAN, WAN), idea of network devices (Router, Switch), topology, protocol and a basic idea on Networking Hardware and Software. The Center is poised to incorporate the above topics in its training on ICT by minor adjustment in its training program and adjustment of infrastructure facilities. National Training Council, the apex body in the formulation of training policy has approved a plan to extend the duration of entry-level training from a period of four months to five months. It is expected that additional sessions on training on ICT may be accommodated with a revision of the existing curriculum. However, the current state of manpower and available technology at the Center cannot meet the requirement of any higher-level course on ICT that a successful launching of e-governance warrants. More rigorous training program may be designed through specialized training institutes to address a few advanced level requirements for selected officials with a preliminary background on basic computer technology.

8.2 Developing Infrastructure

Primarily, the government should concentrate on developing and improving the infrastructures that are required for the implementation of e-governance in civil service training. Necessary investment should be made on building ICT infrastructure throughout the country, keeping in mind that the returns from such investment will be of long-term. To ensure equal access to technology for all citizens, government should improve internet infrastructure throughout the country. This will enable every citizen to find and receive information as well as public services from different government organizations consistently and easily. There should be a process to have 24 hour and immediate maintenance for the effective management of e-governance in civil service training.

8.3 Improving Logistic Support

It is very crucial for Government to supply and installation of necessary hardware, customized software and internet connectivity to the field administration offices. Government should consider nationwide networking infrastructure with faster internet speed at the lowest cost. Bangladesh is connected to only one submarine cable at present. It is the time to take necessary actions in order to get connected with an alternative submarine cable with a view to confirming frequent internet connectivity in Bangladesh. Power situation of such thrust area needs to be taken care of with highest priority.

8.4 Ensuring Quality Training

Government should start effective anti-corruption approach to bring transparency in civil service training through e-governance. A civil service officer is required to be available near the system center on a full-time basis. Rector of civil service training institutes should arrange a monthly monitoring meeting and the participation of the citizens must be confirmed.

8.5 Encouraging Public Service Recruitment in a Digitalized Manner

Around half of the respondents have told that the content of the Bangladesh Public Service Commission (BPSC) website is informative but they are extremely dissatisfied with the style. The design features of the website are not attractive at all. Apparently, the design features seem to be insignificant factors in influencing the perceptions of the job candidates. The reason may be the BPSC is the sole central personnel agency in recruiting and hiring first class cadre officials for Bangladesh civil service and the agency feel less impetus in modernizing their hiring process. Around 15% of the respondents think that the BPSC is a corrupt institution and this finding is not a surprising one. Despite this severe image crisis, still people are willing to join civil service applying through the e-recruitment system of BPSC. According to them, the reasons include job security, gaining power, social status, honour and extra facilities. Very few of the respondents are attracted for the holy reason of serving the nation without realizing their personal interests. Therefore, the above analyses indicate that despite negative image (corruption, credibility crisis, etc.) of the institution, the candidates are largely motivated by their perceived personal gains to apply for jobs using the online recruitment system. Now it is required to encourage such motivation of general people towards the existing digitalized public service recruitment system.

9. Conclusion

Civil officials stand in the forefront of e-governance drive. They work as a catalytic agent and thus need to be equipped with proper training—a fundamental component of this drive. However, research on training strategy in e-governance drive is scanty. A study on training strategy on e-governance reveals some facts that tally our findings. There are three level of training in e-government with an emphasis that e-governance is a process and ICT is a vehicle to achieve learning goals of that process. ICT is to be considered as an enabler and not a goal in itself and should be considered in different discrete steps with explicit reference on prerequisites, basic training needed for this course; course related training and advanced training for future or professional courses. The weaknesses of the existing training program on ICT that have been identified in this study and the revision of the contents within the available logistical support cannot meet the requirement beyond the Level 1. The need of the hour is to address these deficiencies through making alternative arrangement of training beyond Level 1. Fortunately, Government has initiated a project in the establishment of a specialized training unit with trained manpower to fill this gap. The establishment of Bangladesh- Korea Institute of Information & Communication Technology (BKIICT) with the technical assistance of the Government of the Republic of Korea may usher a new era in the training for government officials in more specific area of ICT. The objectives are to establish an international Standard Training Institute for Human Resource Development in ICT to meet the challenge of the 21st century, conduct customized course for government officials and offer advanced diploma and post graduate diploma training courses on ICT. The training program under the joint collaboration of Bangladesh Computer Council, an autonomous unit under the Ministry of Science and Information and Communication Technology (MOSICT) and BKIIT on five specific modules may meet the weaknesses in training that have been identified in the study. BKIICT is housed in the Bangladesh Computer Council (BCC) building and is fully equipped to meet training requirements of international

standard. Moreover, there is adequate number of well trained professionals who were trained on ICT from Korea. This arrangement thus can genuinely meet deficiencies that have been identified in the survey. It is expected that this specialized training program can meet the important requirements in the e-governance drive. This paper addresses a very narrow but focused aspect of training requirement in e-governance drive and thus may constitute an input in the future research undertaking on this subject.

References

- Aggarwal, A.K. (2004). *Training in e Government in Promise of E- Governance, Operational challenges*. New Delhi: Tata McGraw- Hill Publishing Company Limited.
- Alam, M. (ed.) (2006). Role and Effectiveness of Bangladesh Civil Service in Achieving Millennium Development Goals, *Developing Civil Service Capacity for the 21st Century Administration*, Dhaka: UNDP.
- Ali, A.M.M.S. (2004). *Bangladesh Civil Service*. Dhaka: University Press Limited.
- Bertot, J. C., Jaeger, P. T. and Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly*, 27: 264–271.
- Dawes, S. S., Vidasova, L. and Parkhimovich, O. (2016). Planning and designing open government data pro-grams: An ecosystem approach. *Government Information Quarterly*, 33(1): 15-27.
- Elkadi, H. (2013). Success and failure factors for e-government projects: A case from Egypt. *Egyptian Informatics Journal*, 14: 165–173.
- Ferguson, M. (2010). *E- Government Strategies- the Developing International scene*, paper presented to: the Conference, Internet, Democracy and Public Goods, Brazil, November.
- Gajendra, S., Xi, B. and Wang, Q. (2012). E-Government: Public participation and ethical issues. *Journal of e-Governance*, 35: 195–204.
- Guha, J. and Chakrabarti, B. (2014). Making e-government work: Adopting the network approach. *Government Information Quarterly*, 31 (2): 327–336.
- Janssen, M. and van den Hoven, J. (2015). Big and Open Linked Data (BOLD) in government: A challenge to transparency and privacy? *Government Information Quarterly*, 32: 363–368.
- Karim, M. R. (2007). Restoring the Credibility of Bangladesh Public Service Commission: Major Challenges and Policy Recommendations, *Bangladesh E-Journal of Sociology*, 4(2): 54-61.
- Keohane, R.O and Nye, J.S. (2000). Introduction, in Nye, J.S. and Donahue, J.D. (eds.) *Governance in a Globalization World*. Washington, D.C.: Brookings Institute Press.
- Khan, M. M. (2013). *Bureaucracy in Bangladesh: A Reformist Perspective*. Dhaka: BRAC University.
- Khan, M. M. (2015). *Civil Service Management in Bangladesh*. Dhaka: United Nations Development Program (UNDP).
- Khan, M. M. (2016). Resistance to Administrative Modernization in Bangladesh, in Classic, A. and Meininger, M. C. (eds.) *Administrative Modernization*. Brussels: International Institute of Administrative Sciences.

- Khurshid, A. (2006). Public policy, training and civil service reforms, *Pakistan Development Review*, 45 (4): 124-130.
- Kim, S. C., Kim, H. J. and Lee, H. J. (2009). An institutional analysis of an e-government system for anti-corruption: The case of OPEN. *Government Information Quarterly*, 26: 42-50.
- Mirchandani, D. A., Johnson, Jr., J. H. and Joshi, K. (2008). Perspectives of citizens towards e-Government in Thailand and Indonesia: A multigroup analysis. *Information Systems Frontiers*, 10: 483-497.
- Navarra, D. D. and Cornford, T. (2012). The State and Democracy After New Public Management: Exploring Alternative Models of E-Governance. *The Information Society*, 28(1): 37-45.
- Ovais Ahmad, M., Markkula, J. and Oivo, M. (2013). Factors affecting e-Government adoption in Pakistan: A citizen's perspective. *Transforming Government: People, Process and Policy*, 7: 225-239.
- Rahman, M. (2009). Regulatory Reforms in Bangladesh: Experience of Bangladesh-RRC and Emerging Challenges, *Regional Conference on Smart Regulation in South and Southeast Asia*. Held in June 24 and 25, Hanoi, Vietnam.
- Ranerup, A., Henriksen, H. Z. and Hedman, J. (2016). An analysis of business models in Public Service Platforms, *Government Information Quarterly*, 33, 6-14.
- Rorissa, A. and Demissie, D. (2010), An analysis of African e-Government service websites, *Government Information Quarterly*, 27, 161-169.
- Sivarajah, U., Irani, Z. and Weerakkody, V. (2015). Evaluating the use and impact of Web 2.0 technologies in local government. *Government Information Quarterly*, 32: 473-487.
- Taufur, SASM. (2004). *Comprehensive Study of e- Government Initiative in Bangladesh*, Planning Commission, Ministry of Planning, Dhaka.
- United Nations, (2013). *World Public sector Report 2013, E-Government at the Crossroads*. New York: United Nations.
- United Nations. (2016). *United Nations E-Government Survey 2016*. Department of Economic and Social Affairs, UN. Available at <<https://publicadministration.un.org/egovkb/en-us/reports/un-e-government-survey-2016>> accessed on 20 September 2017.
- Yildiz, M. and Saylam, A. (2013). E-government discourses: An inductive analysis. *Government Information Quarterly*, 30:141-153.

Community Participation as a Tool for Improving Municipal Service: A Study on Savar Paurashava

Muhammad Rashidul Hasan*

Ridoy Roy**

Sohag Ahmed***

Uswatun Mahera Khushi****

Abstract: The exclusion of people and households from active participation in providing and improving urban basic services is a common scenario of cities in developing countries like Bangladesh. However, community's participation approach is being practiced in small scale for providing different kinds of service facilities i.e. roads, drainage, dustbins, parks and community centers etc. at some Paurashava areas of Bangladesh in recent years. The Paurashava are not practicing it with their own initiatives rather they are encouraged by different projects funded by development partners. This research describes the advantages and disadvantages of people's participation with experience from Savar Paurashava accomplished community participation method in two wards among nine wards. The effect of participated approach on the selected services (road and drainage maintenance) facility of participated two wards in Savar Paurashava are analyzed compared to non-participated other wards in Savar Paurashava. The satisfactions and dissatisfactions with service facilities depend on different factors. For this reason the data for each service facilities were collected on the basis of three different indicators. After collecting the data, satisfaction levels of each service was measured by a scoring matrix and try to find out the level of people's satisfaction in participated and non-participated wards in Savar Paurashava.

Keywords: Community participation, Urban basic service, Municipal Service, Local Government, Paurashava

Introduction

The consequences of urbanization for a country is not a given. Urbanization holds both promise and problems for a country and which feature will come to dominate will very much depend on the nature and efficacy of policy engagement with the urban agenda (Rahman, 2016). In Bangladesh, urban services are provided both by national and local governments. However, the shortage of urban facilities is increasingly being felt in the urban areas of Bangladesh due to rapid growth of population as well as poor provision and maintenance of services.

It has been argued that the participation of citizens can possibly play an important role to enrich local level services as they know best about their problems, needs and demands (Krishna, 2003). Participation, as a principle, is now commonly accepted to be an important component of successful development programmes (Mitlin and Thompson,

* Assistant Professor, Department of Urban and Regional Planning, Chittagong University of Engineering & Technology (CUET), Email: mrhasan@cuet.ac.bd

** Department of Urban and Regional Planning, Chittagong University of Engineering & Technology (CUET), Email: hridoyhimu95@gmail.com

*** Department of Urban and Regional Planning, Chittagong University of Engineering & Technology (CUET), Email: ahmedsohagcuet12@gmail.com

**** Assistant Professor, Department of Local Government and Urban Development, Jatiya Kabi Kazi Nazrul Islam University, Trishal, Mymensingh-2220, Bangladesh, Email: umkhushi@gmail.com

1995). There are great expectations of the benefits of participation in development projects and programmes. It is also hypothesized that participation is able to improve the quality and increase the efficiency, effectiveness, sustainability and coverage of projects and programmes. Promotion of participation is also expected to benefit primary stakeholders, building their capacity and leading to self-reliance and empowerment. In the present context, participation means all men and women should have a voice in decision-making and service facilities provision, either directly or through legitimate intermediate institutions that represent their interests (TUGI, 1997). Such broad participation is built on freedom of association and speech, as well as capacities to participate constructively. Beneficiary contributions of stakeholders to development projects, informal processes of service improvement and service delivery management are all forms of user participation (Krishnamurthy and De Wit, 2000). Stakeholders in a broad sense are those affected by the outcome of development activity positively or negatively.

Savar Paurashava is one of the rapid growing peri-urban centers which are heavily burdened with an increasing and huge population with hundreds of garments industries and other small scale factories and business communities under the Paurashava which creates tremendous pressures for this Paurashava. Savar Paurashava has provided the facilities like roads, bridges/culverts, town center facilities, drains, sanitation, water supply, solid waste management, slum upgrading with micro-credit and community poverty alleviation ensuring community participation at different stages of service provision. In this context, a research has been made on the basis of community satisfaction about the services provided by the Savar Paurashava. This study therefore, will try to review the practice of community participation and the challenges that they faced and its impact on municipal service facilities at Paurashava level. Therefore, this research encompasses the dimensions and level of community participation, its impact on service facilities and users' satisfaction with service facilities etc. at Paurashava level. Ordinal scales to measure level of community participation and a weightage index matrix to measure user satisfaction.

Objectives of the Study

The main aim of this research is to analyze in-depth the current practice of community participation as a tool for improving urban basic service provision at Savar Paurashava. The specific objectives of this study are:

- ✓ To examine the existing mechanism and level of participation of Paurashava citizens in providing and improving selected municipal services in the study area;
- ✓ To find out the differences in the level of citizen satisfaction in receiving municipal services with and without community participation in the studied Paurashava; and
- ✓ To evaluate the effectiveness of existing community participation and to recommend ways to improve it, if necessary.

Study Framework

Improving means the process of something becoming better. This betterment may take the form either quantitative or qualitative improvement or both. In this research the

improving of urban basic services has defined as qualitative improvement. This qualitative improvement has measured on the basis of the citizen's satisfactions or dissatisfactions with the service facilities. This research encompassed the dimensions and level of people's participation, its impact on service facilities and users' satisfaction with service facilities etc. at Paurashava level. Ordinal scales to measure level of people's participation and a weightage index matrix to measure user satisfaction have been used. Thus correlations between people's participation and performance of service facilities have been compared for selected service (road and drainage construction & maintenance) facility of participated two wards in Savar Paurashava are analyzed compared to non-participated other wards in Savar Paurashava.

Qualitative data is collected through interviewing 03 target groups; 1) community people, 2) elected Mayor, Councilors, female councilors of the Paurashava and 3) related Paurashava officials. Quantitative data, on the other hand, has been obtained through questionnaires.

A sample size of 290 households was decided considering very large population and level of confidence required for a valid research and representativeness of data. 50% of the sample (145 No.) collected from the Ward No 3 & Ward No 8, rest 50% of the sample distributed among others ward according their Population size. The issue of limited time and resources was also noted. To avoid potential bias, simple random sampling approach was applied. This approach is particularly useful when "each unit of the population is given the same probability of independent selection" (Kitchin and Tate, 2000). Then the sample was selected on the basis of holdings bearing the numbers $M, M+k, M+2k, \dots, M+(n-1)$

Observations & Findings

Providing service facilities excluding consultation with the users is a defunct process. In contrary, people's participation approach is being recognized as a well-accepted technique in providing different service facilities as it helps to ensure the sustainability of services. However, to what extent it affects people's satisfaction level is to be evaluated in this research.

Mechanism of participatory approach that is practiced by study Paurashava

There are four committees in Savar Paurashava namely Gender & Environment Committee (G&EC), Town Level Co-ordination Committee (TLCC), Town Planning Unit (TPU) and Public Relation Cell (PRC). The main objectives of these committees are to gather opinion of people related to service facilities as well as arrange different kinds of awareness building program. Under Town Level Co-ordination Committee (TLCC) there are nine Ward committees that arrange different courtyard meetings at different Wards. Besides, Slum Development Committees (SDC) gathers opinion from slum areas that are finally presented to TLCC through WC. Figure: 01 shows the process of reaching people voice to the poura authority and in turn the implementation stages. The responsibilities of different committees are shown in Figure: 02. The both figure shows the mechanism of people's participation. The description of different committees and meetings are discussed below:

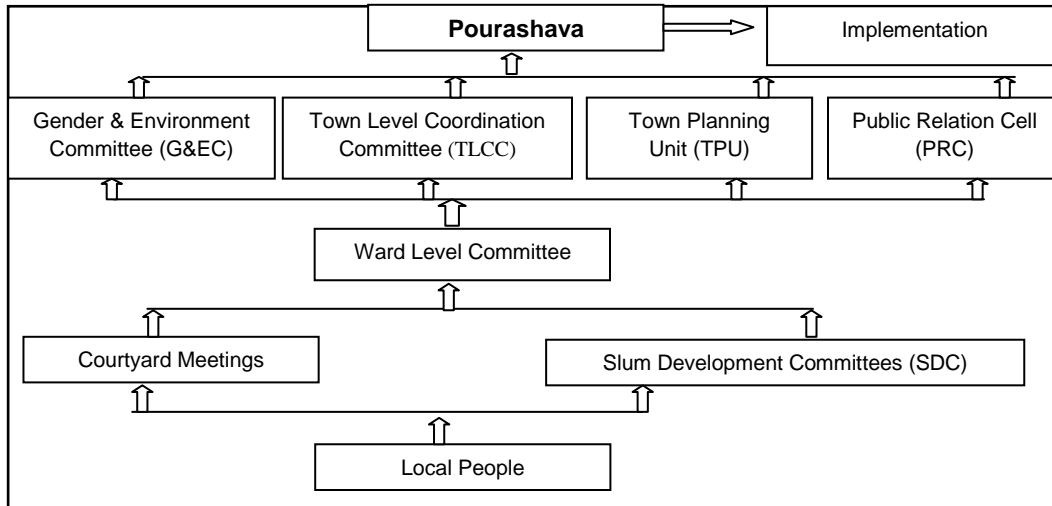


Figure 01: Relationship of different committees of Savar Paurashava

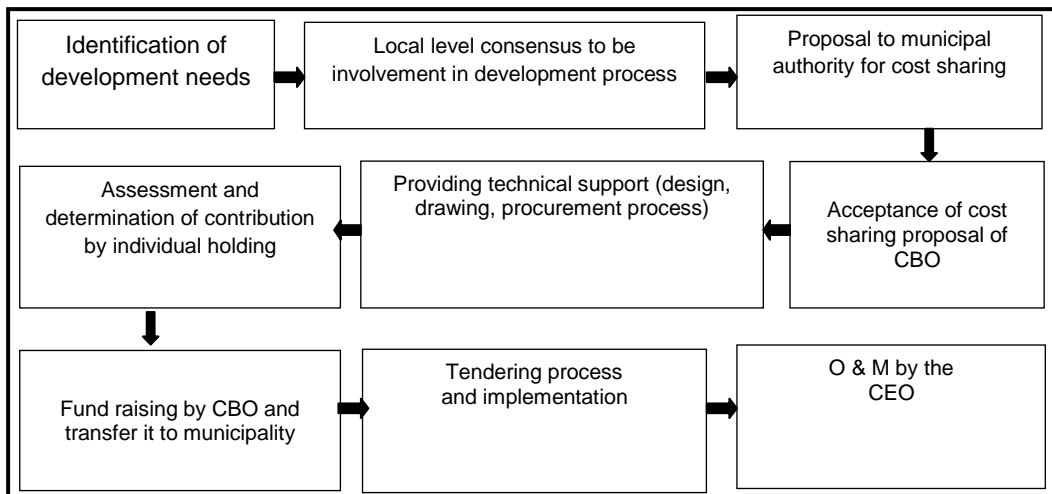


Figure 02: Process of community participation in Savar

Courtyard meeting Savar Paurashava has to arrange courtyard meeting quarterly at every Ward. The participants of these meetings should mainly the poor women of that area. But, In practice the situation is different. The courtyard meetings are not arranged regularly. Though, the female ward commissioners are responsible to arrange the courtyard meetings quarterly and submit the minutes of the meetings to the monitoring authority, but they submit the minutes of more than one meetings by arranging a single meeting. Sometimes the female ward commissioners use these meetings as their post election showdown. For these reasons, the poura authority cannot gather the authentic information from poor people by courtyard meetings.

Ward committee meeting In ward committee, respective ward commissioner is the chairperson and the female ward commissioner is co-chairperson. Sometimes due to

personal conflict and lack of coordination between them, the meeting does not held in every quarter. They both do not want to take the responsibility of arranging the meeting. Some ward commissioner do not participate in ward committee meeting because they think that different issues must be discussed in the meeting and the Paurashava will not be able to solve all the problems and in result the citizen will not vote to that ward commissioner in the next election.

TLCC meeting Savar Paurashava arrange TLCC meeting in every quarter. But in most cases, among 63 members around 40 to 45 members attend in the meeting. Though all members do not attend the meeting but some effective issues are discussed and the issues are being implemented.

Gender and environment committee The main responsibilities of this committee are to identify the social and environmental problems/ issues in Paurashava. They help to prevent women and children repression, dowry, acid throwing, child marriage to be discussed and play the effective role. Savar Paurashava arranges the meeting quarterly and discusses the issues with the members of the committee.

Town planning unit The TPU of Savar Paurashava is very much effective. The member secretary of the committee calls for meeting in every month and discuss different issues with its members.

Actually, Savar Paurashava follows bottom up planning process in providing service facilities. Before providing services, the Paurashava authority calls for the personnel of different sections to attend meeting. After this, the ward commissioners arrange a local meeting in his ward and consult in detail about the project for selecting service scheme list. This meeting is also monitored by the Paurashava staff to ensure the participation from different strata of people of the society. With the discussion to the local people, the ward commissioners prepare a scheme list of selected services, which are actually needed for them on priority basis. Then ward commissioners submit this list to the town planner as well as town-planning unit. The unit screening this list on the basis of legal issue and calculation, estimation and make some corrections and submit the corrected list to Town Level Coordination Committee (TLCC) meeting where the representatives come from different class of society. Another modification may occur in this meeting and the modified list use for preparation of draft final list with the participation of the citizens. This final list placed in to the municipal authority meeting and approved it and send to ministry for gazette notification and approval. After its approval, it is used as a official blue print for implementation of service providing plan where citizens participation has been confirmed trough bottom to top level. Beside this implementation activities the citizens are also encouraged to supervise and monitoring through their presence. In this way for providing service citizens participation is ensured here for big service implementing activities/project

Forms of people's participation

Forms of people's participation means to what extent and how the people are being involved in different kinds of development activities that are implemented by the Paurashava. In Savar Paurashava except ward no. 03 and 08 all forms of participation are almost absent in ward level.

Table 1: Percentages of responses with regard to mobilization of people

| S.L. no | Forms of Participation | Other Wards (in percentage) | | Ward 3 and 8 (in percentage) | |
|---------|---|-----------------------------|------|------------------------------|------|
| | | yes | no | yes | no |
| 1 | Mobilize other people | 55 | 45 | 78 | 22 |
| 2 | Attend courtyard / WC / TLCC meeting | 12.5 | 87.5 | 52.3 | 47.7 |
| 3 | Discuss about service facilities | 30 | 70 | 55 | 45 |
| 4 | Involved in awareness building program | 8.5 | 91.5 | 22.5 | 77.5 |
| 5 | Respond to questionnaire from authority | 40 | 60 | 70 | 30 |

Source: Field survey (July, 2019)

Table 01 shows that 52.3% people of ward no. 03 and 08 attend courtyard meeting arranged by the Paurashava to discuss different kinds of problems and their demands. Generally, these meetings are arranged in poor communities. It also shows that in these two wards, 55% of the surveyed people have experience of discussing with the Paurashava authority about service facilities and the corresponding figure is 30% for other wards in Savar Paurashava. The table also shows that the rates of participation in awareness building programs and responding to questionnaires by inhabitants of ward no 03 and 08 are higher than those wards of Savar Paurashava.

Table 2: Percentages of responses with regard to involvement of people in decision-making process

| S.L. no | Form of Participation | Other Wards (in percentage) | | Ward 03 and 08 (in percentage) | |
|---------|---|-----------------------------|------|--------------------------------|------|
| | | yes | no | yes | no |
| 1 | Give opinion about service facilities | 11.5 | 88.5 | 25 | 75 |
| 2 | Involved in selecting layout of project | 1 | 99 | 10.5 | 89.5 |

Source: Field survey (July, 2019)

Table 02 also explains that though 11.5% people in other wards have the opportunity of giving opinion about maintenance and improvement of service facilities but only 1% of them are involved in selecting the layout of the project. The differences of involvement of people in these two stages indicate that the people gave their opinions, but the project is being implemented according to the decision of authority that was pre designed. The status of involvement of people in these two stages in Ward 03 and 08 of Savar Paurashava is little higher than other wards of Savar Paurashava.

Table 3: Percentages of responses with regard to contribution of people in construction work

| S.L. no | Forms of Participation | Other Wards (in percentage) | | Ward 03 and 08 (in percentage) | |
|---------|---|-----------------------------|------|--------------------------------|------|
| | | yes | no | yes | no |
| 1 | Contribute by labor, money, property etc. | 25 | 75 | 33 | 67 |
| 2 | Construct road and drain | 79.5 | 20.5 | 88.7 | 11.3 |

Source: Field survey (July, 2019)

One of the main achievements of effective community participation is to encourage people to contribute something for the betterment of the project. These contributions may take different forms such as donations of money, portions of property, labor, monitoring the project etc. From these points of view, the people of ward no 03 and 08 in Savar Paurashava are more advanced than the people of other wards in Savar Paurashava. Table 03 shows that 33% people of ward 03 and 08 of Savar Paurashava have contributed or are willing to contribute these sorts of help and other wards the figure is 25.0%. The table also explains that more than 88.7% people of Savar Paurashava ward 03 and 08 have constructed their road and drain to improve the quality of service facility and in other wards the figure is below 80%.

Table 4: Percentages of responses with regard to participation of people in maintenance work

| S.L. no | Form of Participation | Other Wards (in percentage) | | Ward 03 and 08 (in percentage) | |
|---------|-----------------------------------|-----------------------------|----|--------------------------------|------|
| | | yes | no | yes | no |
| 1 | Participation in maintenance work | 21 | 79 | 47.5 | 52.5 |

Source: Field survey (July, 2019)

Proper maintenance of services is very much needed for their sustainability. Generally, it is very difficult for any authority to repair all sorts of damages immediately. In this circumstance, the local people can be involved to maintain the services for minor problems. If a participated approach is followed during maintenance of service people are motivated to take these responsibilities. Table 04 demonstrates that the people of Savar Paurashava ward number 03 and 08 (47.5%) are more conscious about maintenance of services by their own effort than that of other wards people of Savar Paurashava (21%).

Paurashava personnel's and commissioners' view about community participation

For the purpose of examining the views of Paurashava personnel and commissioners of different wards, nine commissioners and eleven employees of Paurashava were interviewed. Among the Paurashava personnel the Executive Engineer, Assistant Engineer, Town Planner, Sub-assistant Engineer, Slum Development Officer, Secretary, Medical Officer, Community Officer, Conservancy Inspector and two consultants were interviewed for the purpose of knowing the effects of participatory approach in providing service facilities. They provided different opinion both in favour and against it. Twenty

respondents of Savar Paurashava criticized people's participation. Among them fifteen respondents claimed that participatory approach impedes the pace of implementation process and five respondents claimed that it causes discord among different groups of people. The personnel and commissioners of Paurashavas were also asked about their satisfaction level with present participation approach. For ward No. 3 & Ward No. 8, 80% respondent are satisfied and only 20% are not satisfied. On the other hand for the rest of the wards only 35% respondents are satisfied and the rest are not satisfied. Finally, they were asked about the necessity to improve people's participation in improving or providing service facilities. 95% respondents of Paurashava gave opinion in favour of improving it and only 5% respondents did not feel about the necessity of people's participation.

Citizen satisfaction on urban basic services

Paurashava and other local government bodies are responsible according to the Constitution of Bangladesh for providing services to their inhabitants. Though they provide different kinds of service facilities, they merely try to analyze the quality of services and users' views about the services delivered. This section demonstrates a comparative analysis of citizen satisfaction from selected service facilities that are provided by Savar Paurashava. To measure the satisfaction level, the services have been scored through people's opinion. Eventually, the factors that cause the differentiation of satisfaction level have been analyzed.

For the purpose of measuring the satisfaction level of the people of the Savar Paurashava, some questions asked the community people regarding four indicators for road maintenance and 03 indicators for drainage facility services. The answer replacements were categorized as very good, good, fair, poor and very poor. Each response of "very poor" to any indicator was awarded a score of 1. Similarly, for the response of "poor", "fair", "good" and "very good", the indicator was awarded the score of 2, 3, 4 and 5 respectively.

The scores of indicators under two different service facilities were summed up for participated and non-participated wards of Savar Paurashava separately. Then the score of each indicator was added to achieve the total score. Next, the total score was divided by the maximum possible score of 2900 for road maintenance and 2175 for drainage facility services and multiplied by hundred to get the satisfaction score scaled to a range of 0-100. Finally, the satisfaction score was measured to the level of very poor, poor, fair, good and very good according to TUGI Index.

Table 5 : Score of road maintenance service of Savar Paurashava

| Ward | Frequency | Criteria | | | | Maximum Possible Score | Satisfaction Score |
|--------------|-----------|------------------------|-------------------|-------------|-------------------------|------------------------|--------------------|
| | | Road Surface Condition | Road Encroachment | Maintenance | Cleanliness of the Road | | |
| Ward 3 and 8 | 145 | 506 | 533 | 481 | 495 | 2900 | 69.48 |
| Other Wards | 145 | 470 | 356 | 432 | 430 | 2900 | 58.20 |

Source: Field survey (July, 2019)

Table 05 shows that the inhabitants of Ward no 03 and 08 of Savar Paurashava are more satisfied than inhabitants of other wards of Savar Paurashava with this service as the satisfaction score of ward no 03 and 08 is 69.48 and that of other wards is 58.20. Road surface condition, maintenance and cleanliness of the road are in favorable condition for both participated and non-participated wards of this Paurashava according to the score. It also reveals that the difference of score of road encroachment indicator between participated and non-participated wards of Savar Paurashava is 177 which is noticeable. It actually happened due to the awareness of ward councilor, authority and ward people. In ward no 03 and 08 of Savar Paurashava; the authority has constructed the market area systematically alongside the main road. For this reason, the opportunity of encroachment has reduced and road surface condition and cleanliness of the road maintained properly by them.

Under the service of drainage facility, 03 indicators which are the drainage condition, drains maintenance status and cleanliness indicators were selected have been taken under consideration to compare satisfaction level with this service between inhabitants of different wards of Savar Paurashava.

Table 6: Score of drainage service of Savar Paurashava

| Ward | Frequency | Criteria | | | Maximum Possible Score | Satisfaction Score (in Percentage) |
|--------------|-----------|--------------------|-------------|--------------------------|------------------------|-------------------------------------|
| | | Drainage Condition | Maintenance | Cleanliness of the Drain | | |
| Ward 3 and 8 | 145 | 447 | 475 | 490 | 2175 | 64.91 |
| Other Wards | 145 | 369 | 342 | 360 | 2175 | 49.24 |

Source: Field survey (July, 2019)

Table 06 shows that the difference of drainage condition score between participated and non-participated wards of Savar Paurashava is 78. But the score of road maintenance and cleanliness of participated wards in Savar Paurashava is higher than that of non-participated wards of Savar Paurashava by almost 133 and 130. It causes the satisfaction score of ward no 03 and 08 to reach 64.91 while that of other wards in Savar Paurashava is 49.24. It actually happened due to the awareness of ward councilor, authority and ward people. It indicates that the satisfaction with drainage service facility is composed of different factors and a service providing authority should give emphasis to all factors specially in other non-participated wards of Savar Paurashava.

In this study an effort was made to compare overall satisfaction level of the peoples with two selected service facilities between participated and non-participated wards of Savar Paurashava through their direct responses.

Table 7: Satisfaction score and level of Savar Paurashava at a glance

| S.L. no. | Indicators | Ward no 3 and 8 | | Other wards | |
|----------|------------------|------------------------------------|--------------------|------------------------------------|--------------------|
| | | Satisfaction score (in percentage) | Satisfaction level | Satisfaction score (in percentage) | Satisfaction level |
| 1 | Road maintenance | 69.48 | Good | 58.20 | Fair |
| 2 | Drainage | 64.91 | Fair | 49.24 | Poor |

Source: Field survey (July, 2019)

Table 7 shows the satisfaction score of participated and non-participated wards Savar Paurashava. It also shows the satisfaction level according to TUGI index. The satisfaction score of two selected service facilities of participated wards no 03 and 08 in Savar Paurashava is significantly higher than that of non-participated other wards of Savar Paurashava. The people of ward no 03 and 08 of Savar Paurashava reported their satisfaction level as good with the services of Road maintenance and fair with the services of Drainage facility. In non-participated wards of Savar Paurashava the satisfaction level with these services are fair and poor respectively. So, it can be said from the table that the satisfaction level with service facilities at participated wards in Savar Paurashava is one grade higher than that of non-participated other wards in Savar Paurashava.

Challenges and immerging issues of Community Participation:

Specific planning programs in municipal level sometimes are literally non-existent, even though community participation works as a key component of planning programs at the local level. There has no real institutional structure to coordinate, evaluate and monitor community participation in the municipal level that can generate conflicts in community participation. The main challenges and immerging issues of community participation at Paurashava level are:

- ✓ Community participation sometimes turned into a traditional exercise and not a systematic engagement of communities that is structurally arranged for the development and service delivery program.
- ✓ The selection of ward committees to represent communities in the development program is also flowed by many challenges.
- ✓ The difference outcome of participatory planning arises in part from a complexity of uneven power relations, trust and lack of belief in having a long-term impact on the status and often people do not trust their representatives as they are mostly corrupted by the systems.
- ✓ Citizens sometimes believe that municipal officials are simply including them with no real commitment to change.
- ✓ Municipal officials tend to avoid explaining the current state of service delivery to communities, the purpose and how the development would be carried out, its benefits and the consequence if community members do not participate in the planning process.

- ✓ This has been linked to municipal official who are unskilled, lack the required training and knowledge base in public and development management methodology to function optimally.
- ✓ Also there are some people from the communities who choose not to participate as a result of negative perceptions about the program.
- ✓ Most of the time people can spend only a limited amount of private resources on community activities due to their economic disability.

Good lessons

- ✓ Community participation is appreciated as locally based planning instruments that could enable municipalities and communities to respond their own requirements.
- ✓ This development planning approaches are based on the principle of comprehensive and typical consultation and participation of all residents, communities and stakeholders in local government.
- ✓ This approach of planning involves the entire municipality, stakeholders and citizens in finding the best solutions to achieve long-term development objectives.
- ✓ It enables communities and local stakeholders to define their goals, needs and related priorities in a municipal area. This could be achieved through structured participation and establishing the conditions for public's involvement throughout the cycle of planning, implementation, monitoring, evaluation and review.
- ✓ The communities can be informed, consulted and be allowed to participate in the planning process that concerns their needs and future. Therefore, municipalities should be responsible for the coordination that can ensure adequate involvement of all stakeholders in the area which ensure the accountability and better output.
- ✓ This process could lead to the empowerment of the community and enhancing their capacity to influence the development process in a meaningful and structured way.
- ✓ The ward committees can play a major role in ensuring community participation.

Recommendations

It is mentioned earlier that Savar Paurashava practices participated approach but it has not crossed the tokenism stage of participation level yet. So, the Paurashava may incorporate the following issues to enrich the approach and to get the fruit from it.

Recommendations on mobilization

The mobilization of people is one of the most important activities to ensure effective community participation. The Savar Paurashava takes its mobilization activities mainly through courtyard meetings and arranging awareness building programs. But due to different constraints it cannot able to attain the objectives of courtyard meeting. It is seen that two important parameters of mobilization are not implementing in full extend. So, the Savar Paurashava authority should take initiative to involve maximum percentage of people in courtyard meetings and awareness building activities. Table shows that more than 52.3% people of ward no. 03 and 08 attend courtyard meeting arranged by the

Paurashava to discuss different kinds of problems and their demands. Generally, these meetings are arranged in poor communities. It also shows that in these two wards, 45% of the surveyed people have experience of discussing with the Paurashava authority about service facilities and the corresponding figure is 20% for other wards in Savar Paurashava. The table also shows that the rates of participation in awareness building programs and responding to questionnaires by inhabitants of ward no 03 and 08 are higher than those wards of Savar Paurashava.

Recommendations on decision making

One of the most frequent criticisms of community participation approach is that the citizens who become involved do not represent the majority rather a “citizen elite” that represents special interests. In Savar Paurashava, both elite and poor people are engaged in participated activities but the percentage is not satisfactory. (Table 1) shows that only 24.5% people of Savar Paurashava have opportunity to express their voice regarding service facilities. This is a very serious problem for the authority because it does not develop any consensus and support for maintenance and improvement of service facilities. So, the Savar Paurashava authority should take initiative to involve maximum percentage of people in decision making activities before providing or improving any service facilities.

Recommendations on construction work

It is not always possible to provide every kind of municipal services facilities by Paurashava authority. If the people of the locality contribute a portion of the expenses, it would be an easy task for the authority to provide the services like road maintenance and drainage facilities. Table 5.2 shows that the situation of Savar Paurashava in ward no 03 and 08 is better than other wards of Savar Paurashava. Another observation is that during the preliminary stage of any project, the implementing authority asked people about their opinion on how the services could be made more effective. (Table 1) also explains that though 11.5% people in other wards of Savar Paurashava have the opportunity of giving opinion about maintenance and improvement of service facilities but only 1% of them are involved in selecting the layout of the project. The differences of involvement of people in these two stages indicate that the people gave their opinions, but the project is being implemented according to the decision of authority that was pre designed. The status of involvement of people in these two stages in Ward 03 and 08 of Savar Paurashava is little higher than other wards of Savar Paurashava.

Recommendations on maintenance work

One of the main achievements of effective community participation is to encourage people to contribute something for the betterment of the project. These contributions may take different forms such as donations of money, portions of property, labor, monitoring the project etc. From these points of view, the people of ward no 03 and 08 in Savar Paurashava are more advanced than the people of other wards in Savar Paurashava. (Table 2) shows that 33% people of ward 03 and 08 of Savar Paurashava have contributed or are willing to contribute these sorts of help and other wards the figure is 22.0%. The table also explains that more than 88.7% people of Savar Paurashava ward 03 and 08 have constructed their road and drain to improve the quality of service facility and in other wards the figure is below 80%.

Recommendations on re-design of the present participated process

- ✓ The present participated approach was designed by giving more priority to women. The participants of Courtyard meetings as well as Gender and Environment committee, are mainly of poor women. Both men and women should be invited to these meetings because discussion from both points of view will be helpful to solve their problems.
- ✓ The courtyard meetings and Ward committee meetings are designed to arrange quarterly but in practice the meetings are arranged irregularly. As the female ward commissioners are responsible to arrange the meeting so, if they are more aware about the necessity of the meeting and arrange it on a regular basis, people will be able to explain their problems more specifically and effective participation will be ensured.
- ✓ In the courtyard meetings, Ward committee (WC) meetings and Town Level Co-ordination Committee (TLCC) meetings, several problems, needs and demands are raised but it does not solve timely. For these reasons the members of those committees are being disappointed and discouraged to attend the meetings. So every above mentioned meeting should revise the issues of previous meetings and how much those have solved should be disclosed.
- ✓ Monitoring of the activities of these committees should be increased.
- ✓ To ensure more effective participation the Paurashava authority should formulate ward level committee with the coordination with other govt. agency or private agency.
- ✓ Citizen charter should be displayed in the Paurashava ground and the authority must preserve the right in favor of citizens to make query about any service maintenance activities.

Recommendations for applying some participated techniques

Specific comments on the advantages and limitations of participated techniques may be followed by the Paurashava authority. The techniques are:

- ✓ Public hearings: The comments and voices of public should be gathered by Paurashava authority on a formal and structured way. Appropriate records should be maintained as the transcript and written statements.
- ✓ Public meetings: Detailed notes of different public oriented meetings should be kept on file.
- ✓ Small group meetings: It is not always possible to arrange the formal courtyard meetings or other kinds of meetings. So, Paurashava authority should encourage people to arrange some informal meetings within themselves
- ✓ Information and coordination seminars: This tool is not used to inform the general public directly, but functions to inform and coordinate with special interest groups, specific individuals and groups representing segments of public.
- ✓ Invitation for written criticism: The Paurashava authority may set a criticism box within Paurashava office for written criticism from public. The box should be opened in every month and the accumulated comments should be discussed in monthly general meeting.

Concluding Remarks

Paurashava are the important wings of local government of Bangladesh. They provide different kinds of service facilities to their citizens. In this research, a comparison of people's participation level and satisfaction with the service facilities of different ward of Savar Paurashava has been made by the hypothesis that people's participation can play an important role to improve the urban basic services in Paurashava areas. It is found that the participation level at most of the ward except ward No.3 & 8 Savar Paurashava is confined within manipulation and therapy stages that are broadly categorized as nonparticipation. On the other hand, ward No. 3 & 8 of Savar Paurashava reaches informing and consultation stages that are part of tokenism level of participation. As people of ward No.3 & 8 Savar Paurashava involved in providing service facilities, they reported their satisfaction level as good with the services of Road maintenance, Drainage. On the other hand, others wards people's satisfaction level with these services are poor respectively. As the study Paurashava have not reached to full participatory stage, the following recommendations should be followed by the Paurashava

The research reveals that the people of the ward no. 03 and ward no. 08 of the Savar Paurashava are more satisfied with service facilities compared to the other ward of the Paurashava. In some cases, in spite of similar quality of service facilities, the people of Savar Paurashava informed their satisfaction more explicitly. It may be happened due to a mental understanding that they were involved during maintenance of these services and the liabilities should come to them. As, there found a significance of satisfaction in participated approach level. also, the hypothesis of the research can be accepted.

References

- Krishna, A. (2003), "Poor community participation in democracy at the local level: Information and education matter more than wealth or social status", Terry Sanford Institute of Public policy, Duke University.
- Krishnamurthy, A.N. and De Wit, W. J. (2000) "Learning Lessons from TheBangalore Municipal Poverty Alleviation Programme ParticipatoryApproaches to urbanDevelopment," Rotterdam.
- LGED,(2010) "Local Government Paurashava Act", Local Government Engineering Department (LGED), Agargaon, Dhaka.
- Mitlin, D. and Thompson, J. (1995), "Participatory approaches in municipal areas:Strengthening civil society or reinforcing the status quo", *Environment and Urbanization*, Vol. 7, No.1.
- Municipal Infrastructure Development Plan (MIDP) with updated Land Use Plan for UGIIP Paurashavas, Savar MIDP (2008).
- Rahman, M. T. (2016). Detection of Land Use / Land Cover Changes and Municipal Sprawl in Al-Khobar , Saudi Arabia : An Analysis of Multi-Temporal Remote Sensing Data.
- Siddiqui, K. (1995), *Local Government in Bangladesh*, University Press Limited, Dhaka.
- TUGI (The Municipal Governance Initiative), (1997), *Governance for sustainable human development report*, United Nations Development Programme(UNDP), NewYork.

Evaluation of Local Government Performance to River Bank-Eroded People: A Case Study on Kachakata Union of Kurigram District

Farhana Akther^{*}
Mst. Sharmin Akter^{**}

Abstract: Riverbank erosion is so unpredictable and complex. It causes huge loss in livelihood as agricultural land and homesteads along with other livelihood options. It is a common problem in many countries of the world though the nature and effect of corrosion may vary. It is the burning issue in Bangladesh. It has high impact on socio-economic sector and life style of the people in the affected area. Local government authority is in direct contact with the effected people and through ensuring efficient, well-organized service provision the difficulties of the river bank eroded people can be reduced and possible to enhance their living standards. Considering the present situation, this study is undertaken with objectives of identifying the existing performance level of local government authority- Union Parishad toward service delivery to river eroded people, analysing and finding out the gap of the Union Parishad for being service delivery to affected people and provide some recommendations to ensure efficient performance of Union Parishad bodies to support people affected by river bank erosion in the study area.

Keywords: Local government, River Bank Erosion

Introduction

The catchment area of major rivers of Bangladesh is 1.65 million square km and only 7.5 percent are within the boarder of Bangladesh (Sarker et al., 2003). The huge amount of catchment area generates 1200 km³ of run-off annually and only 10 percent generate within Bangladesh. About 1.1 billion tons of sediment carry by the major rivers annually (EGIS, 200; Sarkar et al., 2003) and this situation is actually responsible for flooding and river bank erosion in Bangladesh (Elahi and Roggie, 1991). River bank erosion is a regular phenomenon in Bangladesh. It affects millions of lives which is relatively invisible. According to a study conducted by Department of Disaster management 2012, it has been found that out of 462, 100 administrative units were affected to some form riverbank erosion of which 35 were serious, and affected about 1 million people on a yearly basis. Annually rivers erode 10,000 ha of land in our country and make thousands of people landless and homeless. Among 15 to 20 million people who are at risk of river bank erosion 1 million people from 94 upzillas are directly affected (Raju and Taznin, 2015). It has the most devastating effect than any other disaster as it has long term effect on people. Although in National Rural Development Policy, 2000 there is provision for integrated programs under the area specific special development program. In 7th Five Year Plan 2016-2020 also have poverty and inequality reduction strategy and have strategy for rural development; but there is no appropriate guidelines for river bank eroded people (Islam and Rashid, 2011). it does not draw the attention of the government

* Assistant Professor, Department of Urban and Regional Planning, Jahangirnagar University, Savar, Dhaka-1342, Email: farhana_urp@juniv.edu

** Bachelor Student, BURP Session 2014-15, Department of urban and Regional Planning, Jahangirnagar University, Savar, Dhaka-1342, Email: sharminlimaarp17@gmail.com

as other disasters. The initiatives taken by government are mainly concentrated on relief distribution, Vulnerable Group Feeding (VGF), Vulnerable Group Development (VGD). However these programs are inadequate, disorganized, politicized, and ineffective so the government need to focus on other alternatives and initiatives and develop the present initiatives (Mallick.B,2004).

Local Government is the first responder to support riverbank erosion affected people. Local government is responsible to support its community in case of any disaster and for ensuring the safety. it is responsible to do some specific functions as the requirements of the central government as constitutional or optional basis (Malalgoda, et al., 2010). So it is obvious that, appropriate support from local government is must to reduce the sufferings of the river eroded people.

Since Kurigram is a highly river bank erosion prone area. Some upazila of this district is affected by river bank erosion each year. As there is lack of institutions and their activities for river bank erosion management, there need the proper management system. River bank erosion damages the socio-economic property every year but there is lack of initiatives to mitigate those damages. So, the institutional involvement of both local government and NGO'S are needed to mitigate the sufferings of river bank erosion affected people and to take different measures to enhance management system in the proper and sustainable way.

Considering the above mentioned issues, this study has been conducted to find out the performance of the local government authority toward the river eroded people and also to find out their lacking's challenges and finally to find out the solutions to improve their performance

Objectives and Methodology

The objectives of this study is to identify the Local Government's assistance toward river bank eroded people and vulnerable people to river bank erosion and provide a guideline to enhance the performance of local government to river bank eroded people. For fulfilling these objectives mixed method approach was used. For evaluating the performance and finding appropriate solutions for ensuring effective performance of the local government authority (union Parishad) in study area household questionnaire survey was conducted with the effected people, FGD was conducted among the local people to collect qualitative data and a KII (union parishad chairman, counselor, head master of primary school) was conducted to understand the authority's barriers and future opportunities to solve the problems. The questionnaire was conducted using purposive sampling (from the local people, effected people were surveyed). The sample size was calculated using $n=N/\{1+N(e^2)\}$ equation Yamane (1967). Two FGD was conducted containing 8 male members in one group and 8 female members in another FGD.

Literature Review

As local government authorities are in charge of many development functions like land use planning, urban development planning, public works, social services and responding to the needs of the poor etc, they can play the vital role in disaster risk reduction process (ISDR, 2010).

Local governments has been identified as one of the key stakeholder in disaster risk reduction process as they are in charge of critical development functions to reduce disaster risks, such as land use planning, urban development planning, public works, construction safety and licensing, social services and responding to the need of the poor and the under privileged and implementation and strengthening of the decentralization process (ISDR, 2010). UNISDR has addressed the local governments under the theme of building resilient cities in their 2010-2011 campaign. A local government serves various functions as the requirements of the community and also as the directions of the constitution (York 2007).By the acts of parliament and legislation the powers of the local government actually determined (SPICE Briefing, 2002). Usually in developing countries disaster management affairs are actually handled by the national ministry and most of the cases their functions and responsibilities are not well coordinated and decentralized. The lower level authorities are not even adequately delegated (APDC, 2007).

Though local government as an authority has the opportunity to deal with local issues closely and address the problems effectively, but there are lots of arguments whether it can perform vital role or not. Local authorities deal directly at the root level and could act as the main vehicle through which disaster risk agenda become champion (Manyena 2006). The local people should be incorporated in local decision making to implement successful mitigation strategies (Pearce, 2003). However

Local government has the more authority toward planning and construction supervision than the central government and disaster risk reduction and sustainability could be addressed more efficiently by local than the central government (Bendimerad, 2003).

In international discussions the local or municipal level disaster risk reduction performances are recognized in international discussions. The key factor in building resilient communities is the role of local government in dealing with disaster risks .

So the local government has a significant role to play in building disaster resilient areas and in mitigating the adverse impacts of disaster. Though it is clear from the literature that the local government can play vital role in reducing vulnerabilities of the disaster prone people by dealing efficiently with the disaster, but due to not performing their responsibilities properly could not making positive impact in socio economic condition of the vulnerable people. According to Islam et al., 2011, the sufferings and degradation of living standard continue due to unplanned, untimely and political motive initiatives which have minimal positive impacts. Arsenault et al., 2015 in their study on River bank erosion and migration in Bangladesh's char lands explores the internal migration patterns occurring in certain erosion prone areas of Bangladesh The findings show that char inhabitants generally experience multiple migrations in their lifetime. Families often try their best to not leave their communities and to preserve their way of life. It is therefore important to rethink migration along these lines, and to support strategies to minimize the risks and ensure that people are less vulnerable and more resilient to environmental hazards. Rabby, et al., 2013 on their study on river bank erosion showed that over the affected people both the river bank erosion and flood has unique consequences. Erosion act as push factor of migration and it has multilateral impacts on natural resources and socioeconomic condition of the displaced people. Early warning and adequate training as pre disaster strategy and ensuring relief and other basic needs at acceptable price and flexible loan conditions as post disaster strategy could be ensured to make disaster

management strategies more effective (Rahman et al. 2018). So the impacts of river bank erosion to local people is multidimensional and the local government authority can play a vital role in reducing their problems and ensuring effective implementation of national government strategies for the development of the river eroded people.

Study area

In Kachakata Union on Nageshwari Upazila of the Kurigram District, the main rivers are Dudkumar, Brahmaputra, Gangadher and Sangkos. These are non-tidal and un-navigable during all the seasons. Riverine areas are 245sq.km which is 10.67% of the total area of the district (BBS, 2012). River bank erosion is very high in some villages of Kachakata union and the situations become more worsen day by day. The Ganga River is mainly responsible for such type of river bank erosion. The area of Kachakata Union is 508.23 sq. km. There are many river bank erosion points.

Among those points two most effected villages were selected for this study. The number of population in Dhanirampur and Shoilmari are 1642 and 896 respectively.

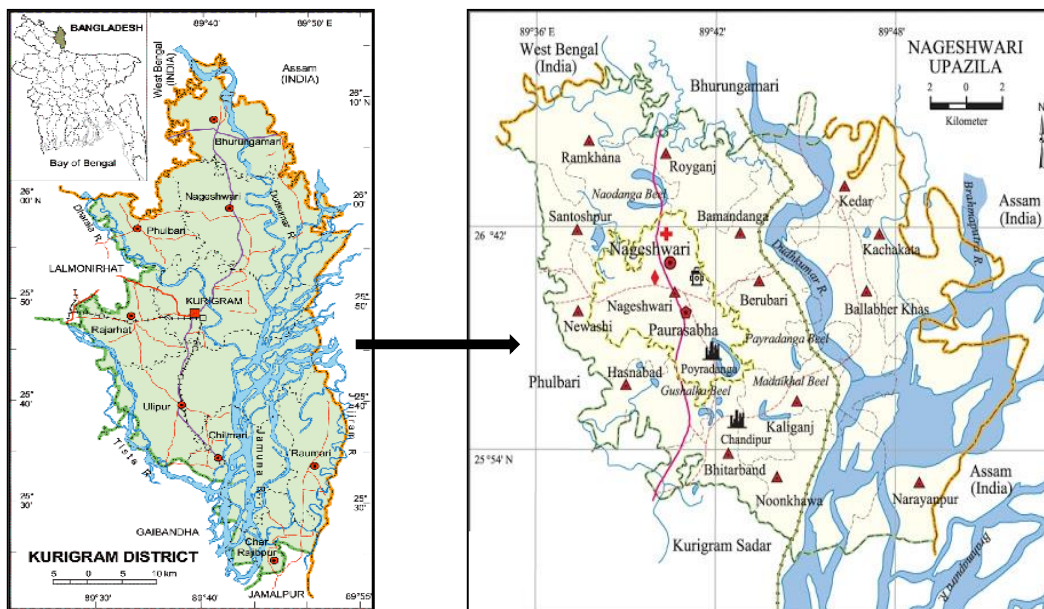


Fig 1: Map of Study Area (Dhanirampur and Shoilmari village of Nageshwari Upzilla)

Source: LGED, 2019, modified by authors, 2019

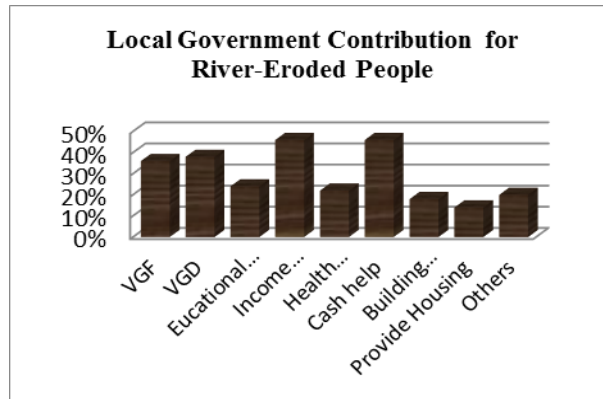
Performance evaluation of Local government Authority (Union Parishad)

Union parishad is the local government authority which is directly connected to the study area. This authority with the direction and guideline of the Upazilla parishad perform their activities. For the socio economic development of the rural people this authority has some assigned activities as mention earlier. This section actually tried to evaluate those performance in term of local people perceptions, who actually the service receiver.

Contribution of Local Government to Support River-Eroded People

According to local government officials, different types of programs are taken for river eroded people like VGF, VGD, Gratuitous Relief Provision, Goat Development Project, Housing Fund, Housing Projects. Actually except VGF and VGD program, no people of these two villages ever heard about these programs. While conducting survey, almost 95% people in the study area seem that there is few involvement of local government to reduce their sufferings. the local government follow some general principles for the distribution of the relief but there is uneven opportunities and the displaces people do not get cash. They only get 20kg of rice by which 5 family member can go only 10 days approximately.

Fig 2: Local Government Contribution for river eroded people

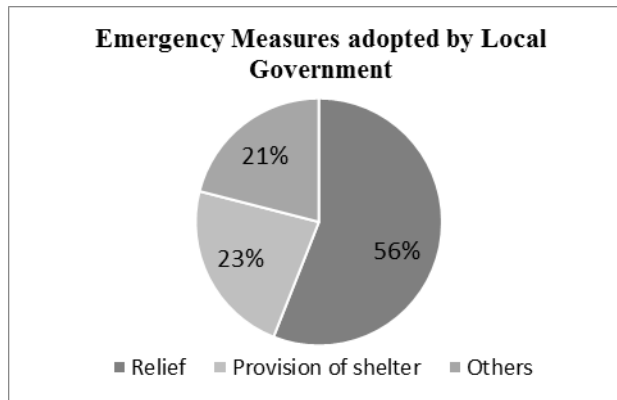


Source: Field survey, 2019

Emergency Measures Adopted by Local Government

According to the local government officials, they have taken some measures to support river-eroded people. These measures include relief, provision of shelter and others measures like post disaster rehabilitation measures to generate employment opportunities, fund approval, sanctioning and evaluation from upazila parishad. But most of the respondent's perception regarding these service delivery is not satisfactory. According to local government officials, about 56% provide relief to the river eroded people, 23% said that local government provide shelters to the sufferers and 21% staffs said other measures like fund approval, sanctioning etc.

Fig 3: Emergency Measures Taken by LG



Source: Field survey, 2019

Local Government Attempts to Reduce or Protect River Bank Erosion

There are no remarkable works of local government to protect or reduce river bank erosion. Only some little steps has been taken by local government. According to 19% respondents, government takes little initiative to protect the river bank near their village. But according to 81% respondents, there has been taken no initiatives to protect or reduce river bank erosion near their village area.

Level of Service Performance of Local Government towards River-Eroded People

During Questionnaire Survey to the effected people, respondents were asked to give their opinion on different performances of local government in different sectors like education, health, sanitation, employment generation, relief distribution, awareness program which was converted over a 5 point scale (0-5), where 0 indicates very low, 1 for low, 2 for moderate, 3 for relatively high and 4 for high. The higher the scale value the better performance is. Performance Index of the mode is calculated from the point of view of the respondents. The study results obtained from opinions of the respondents are presented in the following table.

Table 1: Evaluation of the Service Performance of Local Government

| Sectors | Percentage of respondent's perception in different Scales | | | | |
|---------------------------------|---|----|----|---|---|
| | 0 | 1 | 2 | 3 | 4 |
| Education | 80 | 17 | 3 | 0 | 0 |
| Health | 14 | 65 | 17 | 4 | 0 |
| Sanitation | 38 | 51 | 9 | 2 | 0 |
| Employment Generation Programme | 18 | 44 | 32 | 6 | 0 |
| Relief Distribution | 15 | 43 | 37 | 5 | 0 |
| Awareness Programme | 76 | 24 | 0 | 0 | 0 |

Source: Field Survey, 2019

According to opinions of the respondents, calculation of performance index of local government for a single attribute is demonstrated hereafter. Performances Index of Local Government on Education are following:

$$\begin{aligned}
 I_a &= \sum_{i=0}^n (WiFi)/N \\
 &= (0*80+1*17+2*3+3*0+4*0)/100 \\
 &= 0.23
 \end{aligned}$$

Accordingly, performance index of other sectors based on opinion of respondents are calculated and presented in the following table.

Table-2: Performance Index of Local Government on Different Sector

| Sectors | Performance Index |
|---------------------------------|-------------------|
| Education | 0.23 |
| Health | 1.11 |
| Sanitation | 0.75 |
| Employment Generations programs | 1.26 |
| Relief Distribution | 1.32 |
| Awareness programs | 0.24 |
| Average Performance | 0.49 |

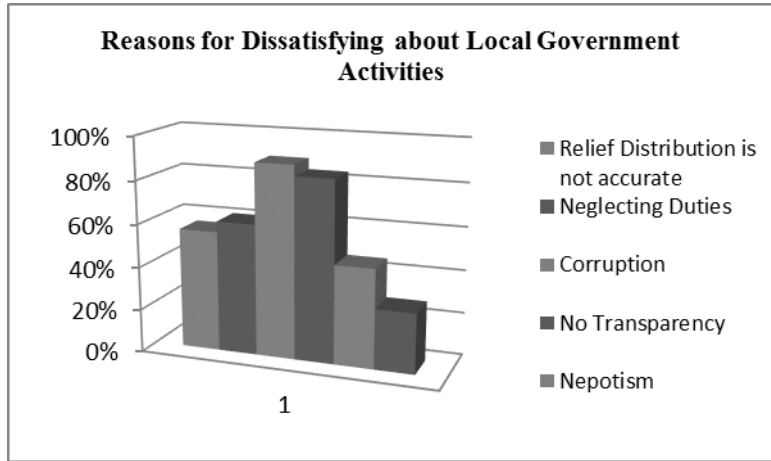
Source: Developed by Authors, 2019

From the table it is seen that average performance of local government towards river-eroded people in different sectors is less than 50%, which indicate low performance. There are no sectors where local government performances are either moderate or high.

Reasons for Dissatisfaction about Local Government Performances

Most of the respondents are dissatisfied about the performances of local government to support river-eroded people. According to them local government do not perform their duties properly. While providing relief, people are selected in terms of corruption, nepotism. Some of the cases relief distribution has not been distributed properly.

Fig 4 : Reasons for dissatisfaction of local people

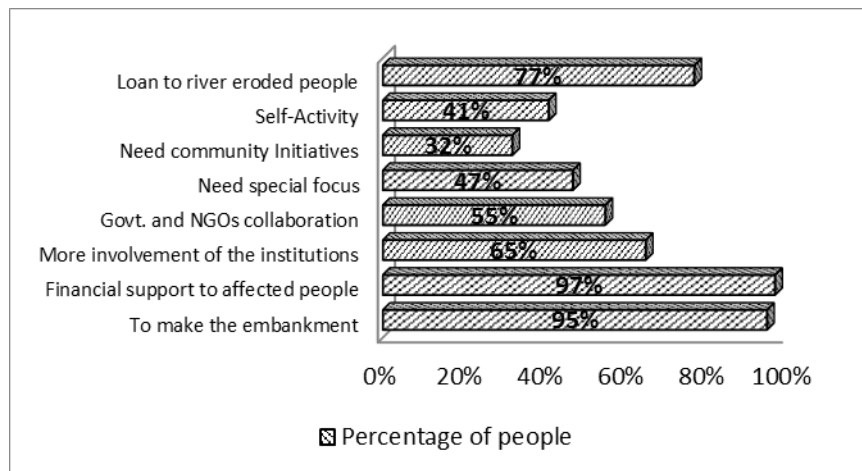


Source: Filed Survey, 2019

Public Opinions to Reduce Their Sufferings with Local Government Support

The people of the study area face different types of problems and damages because of river bank erosion. They would like to get relief from the, they expect the improvement of their living place. The opinions of the people to reduce their sufferings in different issues such as embankment for reducing river erosion,

Fig 5: Public Opinions to Reduce their Sufferings



Source: Filed Survey, 2019

integrated work both govt. and NGOs, helping people in need basis, community initiatives, need more community involvement, need held to affected people, special focus on river bank erosion, self-awareness, self-activity, transparency of local government during service delivery etc. The comments are given in the figure 5.

Opinion of Local government authority regarding their poor performance and potential improvement opportunities

Challenges of Local Government

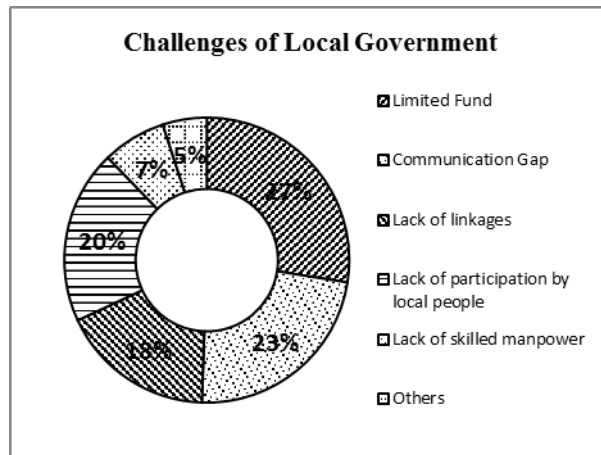
According to local government officials, challenges of local government towards services delivery to river-eroded people are fund crisis, lack of skilled manpower, lack of participation by local people in different programs, lack of linkages between different organizations etc.

Local Government Officials Opinion to Improve the Existing Measures

According to local government officials, the following measures can

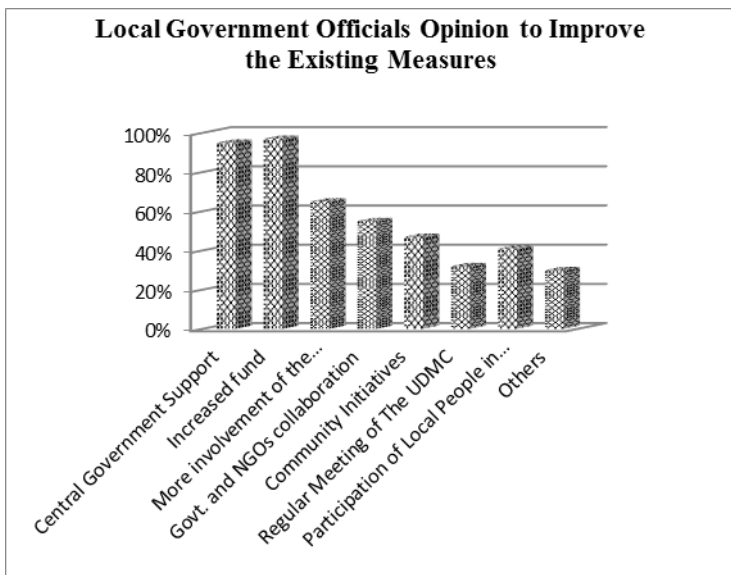
improve the existing measures which have been presented in the figure 7 According to the key informant's interview. It has been found that lack of support from central government and fund crisis is one of the most important reasons for their poor service delivery. Their performance can be enhanced by ensuring adequate fund, involvement of institutions, ensuring government and NGO's collaboration, ensuring people's participation etc.

Fig 6-: Challenges of Local Government



Source: Field Survey, 2019

Fig-7: Officials Opinion to Improve the Existing Measures



Source: Field Survey, 2019

Summary of the findings

The major findings which have been identified are as follows-

- According to Questionnaire survey, local government supports towards river-eroded people is not remarkable, it is only limited to provide some relief works. But these are not sufficient in quantity. In some cases local government arrange temporary shelter for river eroded people but rarely arrange rehabilitation program for Homeless River- eroded people. There is also seen the unequal relief distributions to the river-eroded people.
- Income generating programs for river-eroded people taken by local government are not sufficient. Only short term income generating programs named KABIKHA and KABITA are taken, which cannot address income generation problem in river-eroded people.
- According to FGD, Ongoing Programs taken for river-eroded people by local government are not free from corruption. Most of the cases the beneficiaries of VGD, VGF, KABIKHA, and KABITA are selected in terms of corruption, nepotism an illegal financial transaction.
- Remarkable capacity building program has not taken by local government to support river-eroded people.
- Local Government support is not entirely utilized to its objective because of political pressure. Corruption leading to increase numbers of middleman who will fill their wallet. As a result, inadequate response in case of mitigating the sufferings of river eroded people, very few persons get the adequate relief. As the affected people get food relief and in some case get other necessities, they need to struggle for jobs or works.
- There is lack of transparency and accountability in local government to provide support towards river-eroded people.
- Local government body is not financially solvent to perform proper role to support river-eroded people. In most of the cases local government depends on central government for financial grants and guideline to support river eroded people, because of it, local government body fails to be emergency respondent to support river eroded people.
- In most of cases local government body cannot take decision independently, they depend on central government to support river eroded people.
- Local government body has no sufficient trained and technical manpower to support river eroded people immediately.
- There are no provisions of training program for local people in the study area. The training and awareness programs are rarely arranged for the members of the disaster management committees and officials. As a result, the local people cannot develop their skill and do not make them aware to cope with disaster.
- Remarkable training program cannot be taken by local government body because of limited capacity in decision making and insufficient fund.

- Stakeholder's participation has not properly ensured in different development programs for lack of awareness program in the study area which is necessary to take sustainable measure to support river-eroded people.

Possible solutions for ensuring effective performance of the local government authority

Currently there is lack of coordination among the different government agencies and government and non-government initiatives towards river bank eroded people. Government programs are limited to some relief distribution, Vulnerable Group Feeding (VGF), Vulnerable Group Development (VGD), allocation of khas lands, settlement program based on poor women and public health management. These programs are insufficient, disorganized, and politically motivated and often ineffective. So the local government initiatives must be coordinated, inclusion and participation of riverine community in the local government initiatives must be ensured.

Overall recommendations

By analyzing the overall data it has tried to explore the way forward that how the sufferings of river eroded people can be mitigated with the help of local government. Recommendations are as follows-

- Local government authority must be empowered. The authority must have up to date data about the river eroded people and people who live in risky locations. They must have the capacity to respond quickly and effectively. they must be accountable enough.
- Cluster village project could be initiated but that case authority have to ensure transparent allocation and location of the village should be accessible along with some income sources and proper health care facilities, education facilities and other support services
- Alternate income generating activities must be undertaken considering the local resources.
- The basic rights and security of the local people must be ensured.
- The relief distribution should be more transparent.
- Ensuring public participation in decision making and implementation process. Before taking any erosion control measures and initiatives for rural development local people must be incorporated and their active participation must be ensured.
- Some flexible credit schemes can be undertaken by the Government and non-government organizations for the affected people. It will help them to restart their income generating activities. In Bangladesh there are lots of world renowned NGOs who can organize awareness building programs which will make them aware about their demands.

Recommendations for Improving Service Delivery of Local Government

To address the operational problems and improving the performance of the local government authority towards river eroded people the following measures could be taken into consideration-

- Specific guidelines for the activities of the ward committees, citizens's charter must be incorporated in Upzilla Parishad Act 2009.
- The upzilla parishad must be well equipped with adequate manpower and logistic support services.
- The fund of the Upzilla parishad must be distributed regularly and they must follow a schedule.
- There must be clear guidelines and instructions to ensure the active presence of the personal of UP.
- Initiate mass awareness campaign on the Local Government Support Programs, modalities of programs, fund management and scope and extent of community participation in such programs.
- Regularly access the performance of the upzilla resource team, elected up members and initiate necessary changes and support trainings.

Conclusion

River bank erosion has devastating impacts on the poor and marginalized people. It adversely affects the economic and social circumstances by displacing households, triggering the flow of migration and increasing the poverty.

Union parishad is the local government authority directly deals with the local people and they are the authority through which different services, emergency responses are performed. Due to lack of transparency, biasness, lack of resources, coordination, participation of local people etc. their performance level is not satisfactory. So by ensuring their effective performances it will be possible to ensure effectively address the problems of river bank eroded people. If the authority can successfully address the problems of effected people, it will enable to enhance the socio economic condition of the people, reduce migration.

References

- Arsenault, M., Azam, M., Ahmad, S. (2015). Riverbank Erosion and Migration in Bangladesh's Char Lands. *Environment, Migration and Adaptation: Evidence and Politics of Climate Change in Bangladesh*, (41-62).
- APDC. (2007). *Mainstreaming disaster risk reduction into local governance* [online]. Asian Disaster Preparedness Centre. Available from: http://www.adpc.net/v2007/Programs/UDRM/PROMISE/PROGRAM%20COMPONENTS/Component2/Course/2010/MDRRG_brochure.pdf [Accessed 29 May 2010].
- Bendimerad, S. (2003). *Disaster risk reduction and sustainable development* [online]. Available from: [http://info.worldbank.org/etools/docs/library/114715/istanbul03/docs/istanbul03/05bendimerad3-n\[1\].pdf](http://info.worldbank.org/etools/docs/library/114715/istanbul03/docs/istanbul03/05bendimerad3-n[1].pdf) [Accessed 29 May 2010].
- Bangladesh Bureau of Statistics (BBS), 2012. Population and Housing Census 2011. Community Report, Kurigram Zila, *Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning, Government of Peoples Republic of Bangladesh*, Dhaka,
- Department of Disaster Management, Bangladesh. 2012; Department of Disaster management, Ministry of disaster Management and Relief, Government of the people's Republic of Bangladesh, Retrieved January 2019 from the website: www.ddm.gov.bd/erosion.php.

- EGIS, 2000, *Riverine Chars in Bangladesh: Environmental Dynamics and Management Issues*, the University Press Limited, Dhaka, Bangladesh, pp. 88
- Elahi, K. M. and Rogge, R.J. 1991, *Riverbank erosion, flood and population displacements in Bangladesh: A Report on the Riverbank Erosion Impacts Study*, Jahangirnagar University, Savar, Dhaka.
- Islam, M. F. and Rashid, A.N.M. B. 2011, *Riverbank erosion displaces in Bangladesh: Need for institutional response and policy intervention*. *Bangladesh Journal of Bioethics*, 2(2); 4-19.
- ISDR. (2010). *Local governments and disaster risk reduction* [online]. International Strategy for Disaster Reduction – ISDR. Retrieved from: http://www.unisdr.org/preventionweb/files/13627_LocalGovernmentsandDisasterRiskRedu.pdf [Accessed 28 April 2010].
- Mallick, B (2004), "Local Government: *Local peoples Institution, A compilation on local government Issues*" A H Development Publishing House, Khilkhet, Badda, Dhaka.
- Malalghoda, C., Amaratunga, D., and Pathirage, C. (2010, September). *Role of local governments in disaster risk reduction*. Paper presented at the Construction, Building and Real Estate Research Conference of the Royal Institution of Chartered Surveyors, At Dauphine University, Paris, France.
- Manyena, S.B. (2006) "Rural local authorities and disaster resilience in Zimbabwe", *Disaster Prevention and Management, Vol 15 No. 5, pp. 810-820*.
- Pearce, L. (2003) "Disaster management and community planning and public participation: how to achieve sustainable hazard mitigation", *Natural Hazards, Vol 28 No. 2-3, pp. 211-228*.
- Rahman, M., Hiya, H., Auyon, S., and Islam, M. (2018). Exploring the status of disaster risk reduction focusing coping strategies in Rangpur division of Bangladesh. *Progressive agriculture* 29(3):195-204.
- Rabby, H., Saifullah, A., Sheikh, Md., and Sarker Md. (2013). Recent Study on River Bank Erosion and Its Impacts on Land Displaced People in Sirajgonj Riverine Area of Bangladesh. *International Journal of Applied Environmental Sciences* 2(2), 36-43.
- Raju, M. N. A. and Taznin, A., 2015, *Coping With River Bank Erosion: What Should We Focus On?* *The Daily Star*, 08 March, 2015, Available at <https://www.thedailystar.net/coping-with-river-bank-erosion-what-should-we-focus-on-43199> accessed on 12 June 2020.
- Sarker, M.H., Hugue, I., Alam, M. and Koudstaul, R., 2003, *Rivers, Chars and Char Dwellers of Bangladesh*, *Int. J. of River Basin Management*, 1 (1): 61-80.
- SPICE BRIEFING. (2002) *Local government in Scotland Bill: power of well-being* [online]. Scotland, The Scottish Parliament. Available from: http://www.scottish.parliament.uk/business/research/pdf_res_brief/sb02-69.pdf [Accessed 01 April 2010].
- Yorke, D.A. (2007). "The local government in England and Wales", *European Journal of Marketing, Vol 18 No. 2, pp. 10-16*.
- Yamane, T. (1967). *Statistics: An Introductory Analysis*, 2nd Ed., New York: Harper and Row.

Consolidating Democracy or Accelerating Development: A Comparative Study Between Bangladesh and Singapore

Kamrul Hasan*
Mohammad Tarikul Islam**

Abstract: The paper endeavours to critically analyze the much-hyped question – development first or democracy first – with regards to Bangladesh. The study first tries to define the democracy nexus development in view of “less democracy and more development” in section two. Alluding to the case of Singapore model of development, in section three, the paper explores the prospects and challenges of Bangladesh if the country gives development priority to democracy in section four. The article finishes by proposing that the government sponsored model “less democracy, more development” may not be appropriate to Bangladesh, because people of the country preferred to political rights and freedom than development, therefore, the model may dilapidate country’s historic tradition of democratic values and achievements which will eventually subvert development.

Keywords: Democracy, Development, Governance, Bangladesh, Singapore.

1. Introduction

Can “less democracy” ensure good governance in Bangladesh? Is the model of “more development and less democracy” appropriate for Bangladesh? Is it really an option to pay for development with democracy? Can it work in Bangladesh? The current undertaking is an exertion to answer countrywide recurrently queried many questions like these.

The notion “more development and less democracy” has been the subject of debate from time to time around the world. Of late, mainly with the accession to power of Awami League government in 2009, the discourse has been the issue of mass dialogue in Bangladesh. In particular, after 2014 election, it is appeared that ruling party is approaching to this model -- “more development and less democracy”. Party high ups and government policy-makers argue that “we need development first and democracy later” which received huge attention of mass people and policy expert as well.

On the contrary, other public intellectuals including oppositions, many opine that the government sponsored model “more development and less democracy” would not be appropriate to Bangladesh instead it may dilapidate country’s historic tradition of democratic values and achievements which will ultimately undermine development. Secondly, it may give birth to a monstrous authoritarianism and arbitrariness in decision making which may lead to more corruption and unaccountability. Thirdly, such kind of shift in the nature of political life might result in prolonged violence and political turmoil in the country. Finally, these paradigm shift, essentially, brings forth a new form of centralized tendency of political power and positions.

* Assistant Professor, Department of Government and Politics, Jahangirnagar University, Savar, Dhaka-1342. E-mail: k.hasan@juniv.edu

** Associate Professor, Department of Government and Politics, Jahangirnagar University, Savar, Dhaka-1342. E-mail: t.islam@juniv.edu

Expanding on this backdrop, this research looks to dissect the intricate connection between democracy and development, an inquiry that has distracted scholars and policymakers overall the same for quite a few years, with regards to Bangladesh. The paper comprehensively relies on Singapore model of development and democratic process to use the contention of the endeavor for looking over the paradigm shift in Bangladesh politics that present government is upholding throughout the long term.

The study depends on the secondary source of information that incorporates newspaper articles, books, published and unpublished documents of the government, research and other agencies, papers article and website of relevant agencies that includes academia, development agencies and so on. It continues following: Section two starts by characterizing essential ideas and components of democracy and development and furthermore a conceptual clarity of “more development, less democracy” in section two. To contrast Singapore model of development with Bangladesh, segment three uncovered the wonder of Singapore, examining the variables that help Singapore ascend in the economic advancement. In section four, the possibilities and the difficulties that Bangladesh may look in applying the "more development, less democrac" model are contended which additionally inspect the enquiry if changing example of governmental issues in the nation can be called outlook change followed by an end in segment five.

2. Democracy and Development: Theoretical Framework

Literally, **democracy** means rule by the people. The term comes from the Greek word “Demos (people) and Kratos (rule) which in a word is “Demokratia”. Given that democracy has multifaced connotation and aspects; and means different things to different people (Heywood, 2004), it is, therefore, a herculean task to define democracy within a few words. Political marketplace is replete with discussions and definitions relating to democratic ruling that unyieldingly prompts a vagueness in the comprehension of the term. By and large, it alludes to a political framework that guarantees well known cooperation in government's dynamic straightforwardly or by implication. Notwithstanding, because of the huge size of populace and geology of present-day country state, typically individuals are taking an interest in administrative exercises by implication through delegate chose by individuals which is called indirect democracy. Today, the greater part of the advanced country state practice circuitous or delegate representative government. To find out about the term it very well may be valuable to take a gander at classical definitions. Schmitter and Karl (1991) argue that democracy is a form of government in which rulers are held answerable for their actions in public offices by citizen, acting through the competition and cooperation of their elected representative. This definition emphasizes on ruler's accountability to their electorate. While Schumpeter (1943) defines democracy as institutional arrangement through which individual citizen gain power to decide by means of a competitive struggle for the people's vote. He further adds that reason for the democratic process isn't to choose delegates who do the desire of individuals, however to pick people who oversee for their sake. To Schumpeter, force of individuals is the way to democratic niche in which individuals are real ruler. Dahl keeps up that as democratic system is an ideal kind of government that no nation can accomplish, thus, he likes to utilize an elective term to majority rules system – "polyarchy" (rule by many). In polyarchy, institutionalization of accountable government is prerequisite, according to Dahl (Keman, 2015). Few scholars

(Larry Diamond, Juan Linz and Seymour Lipset,) focus on some factors for democratic process that include 1) legitimacy and performance; 2) political leadership; 3) political culture; 4) social structure and socioeconomic development; 5) civil society; 6) state and society; 7) political institutions; 8) ethnic and regional conflict; 9) the military; and 10) international factors (Chen, 2007). Ellen Grigsby (2012) gives an exact however comprehensive meaning of democracy: Democratic government will be government in which individuals and the public authority are associated as far as both the information and the yield measurements of the public authority. That is, individuals are self-administering regarding input and the yield (laws and strategies) of government shows that administration is in the possession of a self-overseeing individuals. Taking the above definitions and clarification into thought, it very well may be said that in a genuine democratic government framework the key is individuals' cooperation in government straightforwardly or in a roundabout way. View on how individuals can take part in dynamic varies from one individual to another and thus it is easy to refute. Be that as it may, a few parts are fundamental to the democratic government (Sargent, 2009, Harrison,2003) that are as follows:

- a. Active involvement of citizen in decision making
- b. Free and fair electoral system
- c. The rule of law
- d. Protection of Human rights
- e. Freedom of speech, opinion, choice, press and media
- f. Independent and functional judicial system
- g. Political and economic equality

It is risen up out of the conversation that democratic government isn't simply holding races, having institutional arrangement by name and not a decent number of print and electronic media. It is important what these establishments produce. It is a majority rule framework when there exists genuine support of individuals, non-one-sided and reasonable political decision, free and unbiased media, law and order, uniformity regarding political and economic.

As such majority rules system, **Development** is another equivocal term that has multifaceted meaning and may mean various things to various people. It is a sort of certain and wanted change in individuals' life, starting with one state then onto the next stage, generally, poor to more readily condition. It would not be misrepresentation to say that each country state recorded in the LDC and agricultural nation club endeavor to accomplish development. Some of the time economic development is intended for advancement yet development is nearly smaller term than improvement, it is important for improvement yet it is distant from everyone else can't ensure advancement. Advancement is all the while an advancement in friendly and economic existence of a country, it acquires subjective and quantitative change human existence. Definition of development has been evolved with the passage of time and experiences achieved by the economists. At least three major shifts in the definition of development have been identified by Todaro (Todaro & Smith, 2003): a. traditional approach; b. new approach; and c. capability approach. Traditional style suggests that development is achieving per capita income at a sustained rate that enables a nation to extend its yield quicker rate than

that of its populace. Albeit, in 1950s and 1960s, many non-industrial nations accomplished their objective place of economic development, notwithstanding, the expectation for everyday comforts of mass individuals remained practically unaltered that prompts new meaning of monetary turn of events. This new pattern, hence, advocates that meaning of development should be re-imagined and incorporate three things: decrease of destitution, imbalance and joblessness. Development, henceforth, as Todaro proposes, ought to be seen as a multifaceted interaction that incorporates stamped changes in friendly designs, well known mentalities, and public organizations, along with the speeding up in monetary development, the decrease in imbalance and neediness. The third method, capability approach, is presented by Amartya Sen. He provides one of the best definitions of development in his famous book “Development as Freedom”. He argues (2001) that “development is about creating freedom for people and removing obstacles to greater freedom. Greater freedom enables people to choose their own destiny”. To Sen, development can be achieved through freedom, hence, development means freedom. He also maintains that obstacles for freedom are necessarily obstacles for development that include poverty, lack of economic opportunities, corruption, poor governance, lack of education and lack of health.

Again, Todaro points out three core values or components to comprehend the development deeply. These are a. sustenance – the ability of a person to meet basic needs; b. self-esteem – to be a person; and c. freedom from servitude – to be able to choose. Development also refers to freedom that enables people to decide his/her destiny without facing any difficulties. In this study we used a phrase “more development and less democracy” or “Kom Ganotantra, Beshi Unnayan”. For better understand we clarify the term in the following section.

“More development and less democracy”: The ruling Awami League (AL) started to use the phrase with accession to power in 2009. However, the phrase “more development and less democracy” or “Kom Ganotantra, Beshi Unnayan” was recurrently unofficially used by them after the flawed election of 2014. By and large, the election was a unilateral game with 153 seats out of 300 uncontested which attracted huge backlash at home and abroad. It seems that in response to this hyper condemnation, some high officials of AL including Sheikh Hasina – president of the party, tends to popularize the notion of development. They also sometimes used to say “development first, democracy later” which means that the priority of incumbent is development not democracy. Before the 2014 general election AL repealed the provision of Caretaker Government, a minimum constitutional guarantee of free, fair and non-partisan election, in the country’s constitution. The move was seen as a blow to democratic progress by mass people, academics and oppositions which later revealed that it was designed to manipulate general election. Gradually the AL government initiated several mega development projects that are highlighted in their party meetings, electoral rally and manifesto. In the meantime, the government launched ten mega projects in the country namely: Padma Multipurpose Bridge, Dhaka metro rail, Payra deep sea port and so on.

As deemed by the ruling party’s official activity and statement “less democracy” is meant that development is first and it is okay with flawed electoral process, self-censored and controlled press and media, little or no space for opposition, deteriorated human right situation, severely controlled people’s voice through digital security act and arbitrary

detention and arrest, crack down on critics, right bodies, academics and opposition etc. The ruling party is ready to accept development in the cost of democratic governance. It means a shift from democratic process to autocratic trend, priority of infrastructural development to democratic process, focusing and highlighting GDP more than living standard and quality of governance. The flawed electoral process includes occupying polling center by ruling party activists, forcibly outing opposition agents, prevent general voters to go centers through intimidation, substantial decline in voter turnout due to unfavorable voting atmosphere, fake voter line in front of polling center, bias attitude of election commission, absence of level playing field, involvement of government official and law enforcing agency in election manipulation in favor of incumbent. While development in Bangladesh is indicated only infrastructural development such as roads and highways, bridge, railway and so on. Although, infrastructural development is a usual activity of any government, however, the Awami League government initiated a handful of megaprojects, for example, 6.15 km long bridge on mighty river Padma, much expected Dhaka metro rail, four-lane and six-lane highways etc. The ruling government, therefore, termed this drive “more development” as they focus more on structural development than on democratic issues, say, election, freedom of media and space for opposition in politics.

3. “More development and less democracy” model: Examining the Singapore miracle

Incumbent government often speak out that Bangladesh would be Singapore in terms of economic development. This section, therefore, discovers the success story of Singapore analyzing factors that help Singapore to be the world surprise by its economic development and good governance. Experts point out many factors to explain the development of Singapore. Some of the factors are here revised those are unique compared to other countries in particular Bangladesh.

Meritocracy, Pragmatism and Honesty (MPH): Magical power for Good Governance and Economic Development

According to Mahubani (2006) three principal factors attributed to Singapore’s rise to success, (i) meritocracy (recruiting public officers on the consideration of their talent regardless of their political or ethnic identities); (ii) pragmatism (adopting the most efficient mechanism available in the global arena and applying in the local context); and (iii) honesty (being extreme and merciless in practicing honesty and integrity in public offices).

In 1965 when Singapore gained independence from Malaysia, it was enlisted as developing country. Naseer (2016) states that its per capita income of \$500 was nearly the same as Bangladesh’s then and even had children with malnutrition. Today, per capita income of Singapore has rocketed from \$428 in 1960 to \$65,233 in 2019. The country has also shown record success in the reduction of infant mortality which has gone down to 2.1/1000 in 2019 from 35/1000 in 1960 (World Bank, 2021). With the leadership of three founding leaders – Lee Kuan Yew, 1st Prime Minister, Goh Keng Swee, and Mr. S. Rajaratnam – the country has successfully implemented the MPH policies and now empirical data shows that Singapore is a successful nation bringing progressive changes in the standard of people’s living.

'Meritocracy' has normally been integral part of the political process and mass people selected only those persons who were the most capable for public offices such as parliament. The philosophy of 'meritocracy' has also been strongly applied for the country's education system to make it clear that for development quality education is the key. Therefore, 'meritocracy' has become an effective tool for human resource development and recruiting talented candidates in the key leadership positions. Lee Kuan has put 'pragmatism and honesty' in the first place in designing and implementing governmental policies. He rarely has heisted to be pragmatic even though some policies are against his position. However, Lee's pragmatism has been achieved in the cost of some political liberties, for example, silencing political and other opposition. His principle of pragmatism is reflected in his own words: "I learned how to govern, how to dominate the people, as the British did, and how the Japanese used their power (Nasser: 2016)."

Social Policies of Singapore's Success Story

In an analysis, Kishore Mahbubani (2013) takes account of seven pillars of Singapore's economic rise to success. Firstly, extraordinary leadership; it is appeared that psychological height of country's founding father is similar to that of America's. Undoubtedly Lee Kuan was a global leader, however, Goh Keng Swee and Rajaratnam were also well-known for their excellent leadership. Secondly, the good governance which includes meritocracy, pragmatism and honesty. Law is equally applied to all the citizen irrespective of political and social position that means the law exists above the executive even. The whole executive is obviously subject to that law which applies for the rest of people. Therefore, it was possible to punish an ex-law minister when he was found to be guilty of breaking the traffic rules. In the country, everyone is under law. Thirdly, language and multiculturalism which unites people together. It was very difficult to bring people under an umbrella as the country has different people belong to heterogenous cultural background. Therefore, it adopts strong laws providing with extreme punishment against any incidents of racial or religious crime. Interestingly, rules and regulations associated with housing policy assure the coexistence of minority people in every housing estate. It is considerably rare in the world that Singapore achieved in terms of multiculturalism. Fourthly, English Language which is widely spoken in Singapore and it is remarkable phenomena in Asia. Both English and mother tongue are the language of instruction in schools. This exposure to the English language not only extends language skill to pupils but also provides opportunity to explore developed western societies. Sixthly, green environment; surprisingly, Singapore has more types of trees compared to nearly 50 states of the United States. What is catalyst for the green landscape is that the country observes Tree Plantation Day every year to keep itself green. Finally, Singapore is one of most open and liberal societies in the world where, according to the World Bank, doing business is easy. The Economist Intelligence Unit placed Singapore as the third most competitive city in the world next to New York and London. Haskins (2011), on the other hand, in his powerful writing explores the social policies of Singapore which leads Singapore an exceptional example for development. He also mentions three wise policy decisions which have had sustaining influence on Singapore's society. The first was to emphasize education; the second fruitful decision by Singapore's early leaders was to build the nation's social policy related to pension and healthcare; the third emphasis of Singaporean social policy is housing to create national unity among Singaporean people.

Clean and Effective Governance: Combating corruption and maintaining law and order

In many global indexes, Singapore has been ranked high in terms of governance, maintaining law and order, standard of living, fair and just judicial system, corruption free bureaucracy. It was ravaged by rampant corruption, poverty, poor healthcare and illiteracy at the immediate post-independence period. Breaking out from Malaysia, Lee Kuan adopted technocratic government which emphasized on “competitive, meritocratic and result-based economic policies” (Hussain: 2015). Singapore has achieved sustained excellence in education and research and stands in the top ten countries in the world (World Economic Forum: 2018). In particular, Singapore ranks first worldwide for public sector performance, one of the categories of the institutions pillar, where it also excels (2nd). The country also possesses superior transport infrastructure (2nd), its labor market is extremely efficient (2nd), and its financial sector is well developed, stable and trustworthy (3rd). Singapore’s macroeconomic environment (18th) has slightly deteriorated as a result of a persisting deflationary spell. There exists room for improvement among innovation (9th) and business sophistication factors (18th). Singapore continues to lag behind the world’s most prolific innovation powerhouses in these areas (World Economic Forum: 2018).

As mentioned earlier, the zero-tolerance policy of founding fathers to the corruption is a remarkable governmental policy that results in clean government in the country. Though, the Corruption Practices Investigation Bureau (CPIB) was founded by the British colonial government in 1952 as an independent body to investigate and prevent massive corruption in both the governmental and non-governmental sectors, its performance was not up to the mark. The situation has dramatically been changed after the independence. The body is attached to the Prime Minister’s Office (PMO), working under a director, who can directly report corruption cases to the Prime Minister. Singapore’s anti-corruption strategy focuses on four pillars – “i) effective anti-corruption law; ii) effective adjudication to punish and deter those who are prone to corruption; iii) effective administration to reduce opportunities for corruption; and iv) effective enforcement agency” (Anti-Corruption Authority: 2010). In 2020 Corruption Perception Index (CPI), the body ranks 3rd globally in fighting corruption placing Singapore is in the list of least corrupt country. Quah (2017) confirms two influencing factors brings Singapore’s outstanding success in combating corruption: true political will of the People’s Action Party (PAP) and effectively enforcement of corruption laws in all corruption cases impartially, independently, without fear and favor. He continues to maintain that “Lee’s commitment to meritocracy, empowerment of the CPIB to curb corruption effectively, reliance on competitive salaries to attract the “best and brightest” citizens to join the civil service, and maintenance to the rule of law, constitute his legacy of good governance in Singapore” (2015).

Public offices in the country are clean, transparent and competitive; openness in government is highly perceptible. Apart from clean and competitive government agencies, judicial system proves to be extremely efficient, service oriented and pro-people. It maintains just, fair and independent position in providing legal service to the people regardless of political and social background of the service holder. (Randhawa: 2018). All are equal before law and nobody is above of it; one cannot escape punishment

just being influential in terms of political power or rich. The team in the Home Affairs ministry ensures the security and safety for its nationals. The Singapore Police Force is working through three guided strategy that are Prevention, Deterrence and Detection. They are liable for providing protection of lives for all the people who are staying at the city state (MOHA: 2018). The country has been ranked 7th out of 181 countries in the Hudson's Global Residence Index (GRI) -2020 by.

The discussion proves that Singapore is successful nations both in terms of economic development and political governance. Its law and order, standard of living, GDP per capita, efficient government offices – legal, bureaucratic and others branches – clean government, social policy – healthcare, education, housing and defined pension system – make it a model not only for Asia but for whole world. Some prefers to say it as 'benevolent dictatorial system' and less democratic but in Singapore public offices are hold by elected officials through competitive general election held in every five years in a regular basis and the there exits clean and transparent public offices.

4. “less democracy, more development” model: Reflection from Bangladesh

Development Politics: Historical Backdrop

Development politics is definitely not a novel case in Bangladesh as it is found in British colonial period as well. British scholars, researchers and defenders contend that pioneer power had acquainted India with modernization and development first. Presentation of created methods of communication network, for instance, railroad, telecom and postal help, setting up current water system framework, developing bank and dam are the significant improvement activities of British colonial government, they fight. Shashi Tharoor (2016) keeps up that when British faces analysis for their very long-term brutal mismanagement in India they attempt to zero in on development and modernization to safeguard their standard. In any case, it is clear that during their whipping principles misuse and extraction of assets in different manners was the essential goal of their misgovernment.

During Pakistan period military dictator Ayub Khan's significant instrument for supporting force was economic development compared to others. During his residency Pakistan had encountered colossal improvement activities like structure streets and roadways, extension, pool and course and water system conspire and so on Ayub Khan likewise dispatched twenty-year viewpoint plan and five-year plan for development all through Pakistan. In any case, Rounaq Jahan contends that his development politics was additionally finished in smoke as it neglected to share power with the different strata of the government and advantage of development reasonably. The main explanation of his disappointment was that the yields of development were not genuinely appropriated among masses rather it concentrated to chosen not many hands of the individuals who surrounded the governing system that brought about dismantling of Pakistan and birth of Bangladesh as an independent nation in 1971 (Jahan, 1994).

Yet again, in Bangladesh, another military dictator H M Ershad used the same tool to sustain in power during 1980s. He reintroduced the development politics of general Ayub Khan in Bangladesh particularly in North Bengal. As a result, a portion of people in few districts of North Bengal namely Rangpur, Kurigram, Nilphamari and Lalmonirhat still

are big fan of Ershad and his Jatiyo Party. Despite notable infrastructural development Ershad had been overthrown through a mass revolt in 1990 due to high scale of corruption, misrule and tyranny. Like general Ayub's tenure benefit of development's project went few hands of those who were henchmen of the regime. Consequently, people remained far away from development's fruits and became outraged and waited for chance to deposed him. Finally, he was overthrown on December 6, 1990. Thus, above discussion proves that development politics which is not pro-people but pro-elite and partisan by nature and mass people remain far away from the common benefit of the development efforts does not succeed.

Incumbent Bangladesh government's political agenda "less democracy more development" "Kom Ganotantra Beshi Unnayan" received huge attention of policy makers and experts, development partners at home and abroad. The ruling Awami League as a political party has legacy of struggle against Pakistani military government for establishing democracy, uprooting economic exploitation, corruption and political emancipation in the country. The party has led the liberation war in 1971 which was aimed at to achieve equality, human dignity and social justice (GoB: 1971). The trending of fighting for democratic rights, institutions and values was also continuing even after independence such as anti-autocratic (Ershad regime) movement and agitation for installation of caretaker government against Bangladesh Nationalist Party (BNP) government.

Paradoxically, the ruling Awami League took a volte-face to the path of "less democracy and more development" model which was also the political strategy of then Pakistani dictator General Ayub Khan to hold in power for long. The party started to publicize the agenda when it assumed office in 2009 and gave it the full-fledged advertising after the non-competitive, voter less and widely disputed general election of 5th January, 2014 (Haque: 2017). Why does the party take this U-turn? This query haunted many of the observers of Bangladesh politics. However, the prime objective of this section is to find out whether the "more development and less democracy" model is suitable for Bangladesh or not, or what are the prospects and challenges of this model.

Prospects for economic development in Bangladesh

Bangladesh is going through a unique phase of infrastructural development in roads and highways, railways, bridge, power and energy, sea port sectors. The several major development initiatives include Padma Multipurpose Bridge (PMB), Dhaka Metro Rail project, Payar deep sea port, Karnaphuli tunnel, Rampal power plant, Padma rail-link project, Chattagram-Cox's Bazar railway, matarbari coal power plant and Roopur Nuclear power plant etc. (Table-1). The PMB will enhance economy of the nation connecting nearly 40 million people of 21 South-Western districts to capital Dhaka and other parts of the country. The South-Western region of the country is industrially and commercially backward because the region is separated by mighty river Padma and Meghna, and there is no direct land connection between the region and capital Dhaka. The transportation is currently dependent only on ferry system and speed of the traffic is heavily hampered by tailback that's why the region's economy is not advanced as much as other parts of the country. Additionally, the life and livelihood of the region's people is worryingly damaged by recurrent natural disasters. Once completed the project, the

region will be facilitated by natural gas which is conducive for rapid growth of industrialization and commercialization that will generate new employment. It will lessen the cost of transport and time consumed in transportation of goods and passengers from Southern region to capital and vice versa. It is, therefore, highly expected that the region, in particular, and Bangladesh, in general, will go through a new phase of economic growth and development. It is estimated that new megaprojects are likely to revitalize the GDP of Bangladesh by 1.2 once they are accomplished (Kamruzzaman, 2019).

Table 1: Mega Projects in Bangladesh (2009 – onward)

| Name of the Project | Project Type | Total Cost (cr) | Project Duration |
|----------------------------------|-------------------|-----------------|------------------|
| Padma Bridge | Roads and Highway | 30,193 | 2009 - 2021 |
| Padma Rail Link | Roads and Highway | 34,988 | 2016 - 2024 |
| Metro Rail | Roads and Highway | 21,985.07 | 2012 - 2024 |
| Chattagram – Cox Bazar Rail line | Roads and Highway | 18,034 | 2010 - 2022 |
| Rampal Power Plant | Power and Energy | 16,000 | 2009 - 2020 |
| Matarbari Power Plant | Power and Energy | 35,984 | 2014 - 2023 |
| Karnaphuli Tunnel | Roads and Highway | 9,880 | 2017 - 2022 |

Source: The Daily Star, 2019

The effectiveness of the PMB project will enhance more when the Payra deep seaport is completed. Movement of goods and passengers would be manifold than present status due to these two mega projects. To give it a momentum the Bangladesh government is building Padma-Barisal and Barisal-Pyra port rail line. Barisal-Dhaka rail connection is much demanded and awaited issue which would definitely change the life of 40 million people of southern districts. Apart from railway, Barisla-Kuakata road is already being upgraded into four lanes and Barisal-Faridpur road is planned to be improved into the same lanes (Financial Express, 2018).

User friendly improved public transport for cities in Bangladesh particularly for Dhaka is a long anticipated public demand. There could be enough smart public bus, metro rail, circular bus and rail service and waterbus service in rivers surrounded by the city. These projects can ease off the public suffering to an extensive degree from unbearable traffic jam. Understanding the significance of the rail ways in city life the present government put forwards metro rail project with great emphasis. Now, Dhaka metro rail is one of the remarkable ongoing megaprojects which is expected to be completed by 2021. To connect the Dhaka city in shorted possible time with other regions and cities there need linked roads in every side of Dhaka city. The government is updating five highways in multiple lane such as Dhaka- Mymensingh, Dhaka-Paturia and Dhaka-Sylhet highway four-lane and Dhaka-Chattagram, Dhaka-Faridpur eight and six lane roads. The Dhaka-Chattagram railway is also being improved and updated by adding high speed train and setting up new rail lines.

It is clear that when the country will see a new phase of industrialization and growth it will be thrust for huge power and energy which will be the core of development. To meet the projected demand of power and energy for rapid industrialization, the government is

building three coal-fired power plant – Payra Thermal Power Plant 1320 MW, Matarbair Power Station 1200 MW and Rampal Power Plant 1320 MW – and one 2.4 GW nuclear power plant (see table-1). When the power plants are operated it would provide low-cost electricity and also create new job opportunity in the country. It is estimated that these plants will enhance the production of power in Bangladesh and will make it independent in energy sector.

Challenges of development in Bangladesh

Many of the government high-ups, supporters and pro-Awami league intellectual whoops that the nation may rise to economic prosperity like Singapore and Malaysia through this model. On the contrary, including oppositions and other public intellectuals, opine that the government sponsored model “more development, less democracy” would not be appropriate to Bangladesh rather it may dilapidate country’s historic tradition of democratic values and achievements which will ultimately undermine development hence. Consequently, following section will examine the prospects and challenges of Bangladesh comparing the propositions of Singapore’s economic development.

First, Singapore is lucky enough to have efficient and honest leader like Lee Kuan Yew – the founder premier of the city state, Goh Keng Swee, and Mr. S. Rajaratnam (Mahabubani: 2017). Lee – a graduate of law – was very efficient and visionary leader. By contrast, Bangladesh faces such type of leadership crisis particularly when it comes to honesty and efficiency (Khan: 2013). All along, the parties in power have demonstrated epic fail in creating successful leadership; leaders could not gain confidence and trust of mass people due to their unthinkable dishonesty. Once they are in power, they just simply loot and steal state treasury in the name of public service and development. Not only political leaders, civil military bureaucrat including judges are also highly corrupted, opportunist and extractive in nature. Surprisingly, there is unholy nexus between duo. Others such as dishonest businessmen, journalists join their hands to the alliance and grab undue privilege. Transition of power from one party to another and changes in the leadership of parties bring no positive result in leadership pattern it; “only created the metaphor of ‘drinking the same from different bottle’ but didn’t bring any changes in the status quo of creating leaders” (Mamun: 2016). Political leaders are not only corrupt but also incompetent, they are parochial in attitude, short in vision and violent in behavior. Supreme leadership position of the three major political parties in the country – Awami League, Bangladesh Nationalist Party (BNP) and Jatiya Party – is occupied by hereditary leaders which remained unchanged for nearly three decades (Jahan, 2015). Arguably, most of the top brass of major parties have faced graft cases and served imprisonment, even they are also accused of murder for opposition leaders and activists. Thus, such type of leadership can hardly lead Bangladesh towards sustained progress.

Secondly, sustainability is a major question of these abovementioned megaprojects. The incumbent government has, in the meantime, built a number of flyovers in Dhaka and Chattagram city to ease off gridlock. However, these seem to be useless because, now, it is appeared that traffic jam is usual picture on and under the flyovers simultaneously. Rather these erected flyovers increase the traffic pressure as both of their ends meet with the main roads get congested quickly and, become burden of development (Shyok, S. K. 2019).

Therefore, the objective of these development project comes under suspicion and critical questions. Number of specialists on structural design, economic development and environment argues that most of these development drives might not be sustainable in the long run (Morshed, 2019). They apprehend that these projects might be a liability for sustainable development rather than key to development. For example, the major question arises on Dhaka Metro rail projects: will metro rail be able to mitigate Dhaka's awful gridlock? A number of other factors are also considerable as Morshed (2019) points out:

“people's willingness to adapt to a lifestyle based on public transit; affordable fare; easy accessibility to metro stations; user-friendly; its integration with other modes of transportation; distance between home and train station; mode of transportation from home to train station; parking space around metro station; pedestrian infrastructure like footpaths leading to metro station; gender sensitivity; and, last but not the least, whether the status-conscious middle-class would sacrifice its love of personal cars to embrace public transport.”

Some of these projects have design flaw that questions the very planning and design of the projects. Padma bridge rail link is found to be faulty in structural design; the flying junction at Zajira point in Shariatpur is shorter (5.5 meters) than the expected level of 5.7 meters. The low height of the overpass might hamper movement of lorries or loaded trucks (New Age, 2020). Metro rail, on the other hand, is being constructed at below internationally accepted heights. This likely to blocks solutions to other modes of transport (Financial Express, 2020). Result of faulty design might cause a catastrophe in future; it might collapse or be useless. Site of some projects comes also under questions and triggers countrywide protest, for example, Rampal coal-based power plant. Civil society members, environmentalists and other related stakeholders protested the move of government. It is argued that Rampal power plant will seriously damage the country's only mangrove forests and its ecosystem. In addition to Rampal, the government have pushed more three coal-based power plants that are harmful for human being and natural environment. The human and environmental cost of some of these projects might accede the economic benefits in the future (Bangla Tribune, 2017).

The construction cost of these projects is many times higher than any other country in the world. Budget and time have been frequently changed in most of the projects that proliferates the building cost. The cost of the PMB was changed thrice that primarily was BDT 10,162 crore in 2007; upgraded to BDT 20,507 crore in 2011 and finally BDT 30,193 crore in 2018 (Daily Star, 2018). In Assam, India, 4.5 km Bogibeel bridge was built only by 5000 crore INR on river Brahmaputra (Times of India, 2018). The cost in other infrastructural projects such as flyover, highway, and metro rail has also changed recurrently and higher than any other nations. The World Bank termed the cost of infrastructure in Bangladesh as “world's costliest” (bdnew24.com). According to World Bank a new four-lane highway should cost taka 17 core/KM, however, the estimated cost in one project alone could go as high as Tk118 crore per kilometer, nearly seven times higher than World Bank's recommendation.

Thirdly, Bangladesh has historic long tradition of struggle for democratic system and egalitarian society. It is, therefore, a big question whether the people of the country will accept mere development in the cost of democratic system for which they have paid

much. It is highly assumed that people are not ready to sacrifice the political liberty and democratic practices for development. The then Pakistani military dictator General Mohammad Ayub Khan celebrated his tenure (1958-1968) as 'Decade of Development' which was not naturally welcomed by the mass people of then East-Pakistan (Jahan: 2015). Also, Moulana Vashani, in 1970 general election, chanted a slogan "vote er aage vaat chai – food before vote" which did not incur any appeal among the voters, instead, they were seen to be more enthusiastic to politics and political practices. It is, therefore, apparent that People of this land are not ready to accept development in exchange of political rights – right to vote, freedom of expression, freedom of press and media and most importantly right to dissent.

Fourthly, endemic corruption may be the major challenge for developmental activities. Corruption has been so intrinsic value to the governmentality in Bangladesh that it remains in the top of the world's most corrupt nations (Hashmi: 2017). Corruption practice thrives in the country by volume and scale. Deterioration of human rights violation and misgovernance is rocketing. What are factors behind this massive corruption? Hashmi contends that "Lack of transparent and accountable governance, and the prevalence of impunity for well-connected people shroud the real extent of corruption in Bangladesh". He also indicates that moral value of mass people is heavily contaminated with corrupt practice; there develop a corrupt moral value. People – service provider and receiver – are accustomed to the corrupt practices. Getting job and receiving service from the public offices without graft are sheer myth. Even bulk of the people do not mind receiving service illegally. Corruption is pervasive and rampant; the nation is plagued by it. Corruption is unofficially agreed and accepted by all – be it ordinary citizen or government officials such as minister, MP, civil military bureaucrat. Each and everybody either have to pay illegal money or to manage officers for getting service by strong lobby mostly political. Public servants, other than few honest – top to bottom – are accustomed to "speed money" in such a manner that they do not receive salary.

One of the biggest hurdles that development projects suffer from is unbridled culture of corruption. The scale and extent of corruption in these projects break any past records. Malpractice in invitation and processing of tender in favor of ruling party men, producing fake voucher and excessive expenditure are commonplace. Due to the rampant corruption in development projects the quality of some projects is far below standard. For example, bamboo sticks have been used in several development projects instead of iron rod that speaks about the sheer misappropriation of fund from development project (Daily Star, 2020). Development project has been one the primary source of income for political leaders and activists for long. However, the contemporary scenario has been unprecedented and beyond imagination. Sustainability of the development projects, therefore, is under question.

Fifthly, globally, it is beyond any argument that education for sustainable development is the key element. Therefore, as usual, the same maxim is applicable for Bangladesh. Emphasis on education is apparent in National Education Policy 2010 of Bangladesh. In its preface, it is stated that: "education is the key to a nation's development. A properly educated nation, which is modern in genius and intellect and forward-looking in thinking, can only put the country at the zenith of its development. That's why education is the backbone of a nation" (MoE: 2010). Though, the significance of education is agreed in

government policy, it is only few nice words in policy papers not in reality. Real scenario of education is not only completely different but also formidable. Compared to international level, education in Bangladesh is not competitive and this has critical implications upon the overall national development. Education sector is the most vulnerable, ignored, disregarded and less prioritized division. Government expenditure on education, total (% of GDP) in Bangladesh was reported at 1.3263 % in 2019, according to the World Bank (WB, 2019). Fund and other opportunities for research and quality of education is far below standard level. Not a single institution of Bangladesh is found in the world's best 1000 university because the quality and quantum of research is substantially inadequate. Questions in university and medical college admission test is often leaked by a gang of criminal people connected to politics and power. Due to the high level of corruption, undue privileges provided by successive governments to gain illegal support from bureaucrats during election and transition of power and misuse of responsibility, almost 90% of the university graduate tend to go in government job. To be selected in government job they emphasis on rudimentary knowledge such as general knowledge, elementary math and English grammar. As a result, in-depth knowledge, language or computer skills and innovation do not grow in university graduates leaving them only competent for government job. But due to the limited number of seats in government job a great number of graduates adds to the list of unemployment every year. Copying in public test such as SSC and HSC or in university test parlays the moral, ethical standard of the students too. Passing in semester final is not a challenge in Bangladeshi university and college; because students are loosely guarded. Dissertation and thesis in undergraduate and graduate level are not checked by plagiarism software; consequently, most of the monographs are plagiarized at this level. Even complain for plagiarism is often found against many faculties of university.

In the country, teachers' agitation for minimum salary particularly in primary, secondary and higher secondary level is commonplace. If Someone wants to view the scene of education related movement/agitation may find huge evidence in the media.¹ Lack of a unified curriculum has been the bane of the education sector for the past 46 years in Bangladesh. The country is lagging behind the more developed countries in almost every sector because of low quality education. Formidable challenges remain in delivering quality education in Bangladesh. Poor ration of teacher-student, lack of adequate budget for education and research and few or no standard training for teachers are the principal difficulties for quality education in Bangladesh (Rahman et al.: 2016).

Sixthly, mal-governance is another challenge, may be, the biggest hurdle in development drive in Bangladesh. For some development indicators, e.g., economic growth, male-female education ratio, birth control and decline in the child mortality, obviously, it shows notable changes (Riaz: 2016). However, the World Bank (2013) indicates that "improving governance should remain a key priority for the full realization of development aspirations. This includes the effectiveness of government, the transparency of authorities, and stability of political situations".

¹ Teachers' agitation and movement are common phenomena in the country. The prime claim of these movements is that they get little or no salary for teachers. Even university teachers took to street to reduce the salary gap and grade disparity compared to other grade of government employee. Currently, Non-MPO teachers are in fast unto death in the capital. See for more detail, Demonstrating Non-MPO teachers' start fast unto death, The Daily Star, December 31, 2017.

Governance in Bangladesh demonstrates “all the symptoms of an underdeveloped polity”. Because democracy is yet to be institutionalized; and dominance of illegal money and criminals on politics is prevalent. Elections have been so farcing that ordinary citizens act only as passive voters, and, of late, people have little or no right to vote. Power and privileges of the state are fully concentrated in the few hands. Key leaders, particularly president and chairman, of the major political party enjoy unbridled power both in party and in government with little or no accountability to the party-men and mass people. Parliament is handicapped to the dominance of executive and playing the role as ‘rubber stamp’ body. Like legislative branch, judicial system has also been heavily and nakedly politicized and subjugated under political executive. The independence of judiciary just exists in the paper, in reality, it only follows the figure point of the executive. Similarly, extremely poor accountability of public servants and corruption and ultra-politicization of civil service adversely hamper the quality of service. Civil servants are rarely punished for their misconduct, negligence of duty and corruption. The highest and probably frequent punish, if it happens due to huge public pressure, is transfer from existing work station to another (Khan: 2003).

Returning to the question as to how Bangladesh has achieved progress both in economic social arenas. It is not achievement of any particular regime, neither is it an accomplishment of the public sector alone. Above all, these successes are the result of the hard work of the resilient ordinary Bangladeshis, particularly the poorer sections of the society – farmers and workers and an active participation of women in general. Yet, they all face inequality and insecurity under the current economic system and remain marginalized under the extant political structures. The question remains whether the present rate of economic growth and social change – the paradox – can be sustained without addressing the mal-governance.

David Lewis (2013) shows that Bangladesh changed its statehood by four times – populist authoritarianism (1972-75), military dictatorship (1975-1990), era of nascent democracy (1991-2006) and illiberal democracy (2007 - present) – in the last four decades (Lewis: (2013). Historically people of this land struggled and achieved Pakistan (1947), sacrificed lives for language and identity (1948–1952), fought for autonomy, equal rights and opportunity (1954–1969), and finally political independence (1971). Accordingly, constitution of Bangladesh also placed the democracy as one of its fundamental state principles. Mass people led by major political parties again showed their aspiration for democracy during dictatorial regime of Ershad. Finally, they got it in 1991 and this nascent democracy or some prefer to say “illiberal democracy” continues up to 2006 through more or less competitive free and fair election under caretaker government. After two years (2007-2009) rule of military backed interim government, Bangladesh Awami League backed in the office in 2009. Getting back to power, Awami League government, although not officially declared, is heading towards “more development, less democracy model”. Many of the government’s MPs and ministers propagate the slogan of development model. The big question, here, therefore, rises if Bangladesh, under the incumbent government, is going to shift its political prototype – “illiberal democracy” to “elected autocracy” – that may be called paradigm shift in the landscape of Bangladesh politics.

5. Conclusion

We may reach some conclusive sentences that can be inferred from above discussion. First, the government sponsored model “more development and less democracy” may not be appropriate to Bangladesh, because people of the country preferred to political rights and freedom than development, therefore, the model may dilapidate country’s historic tradition democratic values and achievements which will ultimately undermine development. Secondly, it may give birth to a monstrous dictatorship and arbitrariness in decision making which may lead to all pervasive corruption and unaccountability. Thirdly, such kind of transition in political system of Bangladesh might generate formidable catastrophe in terms of bloody clash and severe political unrest that may lead the country to a failed state. Finally, these paradigm shift, essentially, brings forth an extreme form of centralized tendency of political power and positions in the context of Bangladesh.

References

- Anti-Corruption Authority, for details see <https://www.acauthorities.org/country/sg> accessed on June 23, 2018.
- Bangla Tribune. 2017. Protest held globally against Rampal plant, January 08, Dhaka
- bdnews24.com. 2017. Bangladesh infrastructure is world’s costliest, says World Bank, June 21, 2017, Dhaka. Available at <<https://bdnews24.com/economy/2017/06/20/bangladesh-infrastructure-is-worlds-costliest-says-world-bank>> accessed on December 13, 2020.
- Brundtland Commission. (1987). *Our common future*. Oxford: Oxford University Press.
- Diamond, L. Juan, L. & Lipset, S. M. (Eds.) (1995) “Introduction: What Makes for Democracy.” in *Politics in Developing Countries: Comparing Experiences with Democracy*. Colorado: Lynne Rienner Publishers.
- Chen, L. E. 2007. Development first, democracy later? Or democracy first, development later. The controversy over development and democracy. Paper presented at the annual meeting of the Southern Political Science Association. New Orleans. 3 January, 2007
- Daily Star. 2020. Bamboo used instead of rods, August 12, 2020, Dhaka
- Daily Star. 2018. Padma bridge: cost rises again, June 22, 2018, Dhaka
- Financial Express. 2018. Barishal-Kuakata four-lane upgrade: RHD pushes for approval, August 16, 2020, Dhaka
- Financial Express. 2020. The question of height of the metro rail, February 27, Dhaka
- Grigsby, A. 2012. *Analyzing politics: An introduction to political science*, Cengage Learning, Wadsworth.
- Heywood, A. 2004. *Political Theory: An Introduction*, Palgrave Macmillan, New York
- Harrison K. & Boyd T. 2003. *Understanding Political Ideas and Movements*, Manchester University Press, Manchester.
- Hashmi, T. 2017. “Corruption in Bangladesh: Perception vs. reality”, The Daily Star, Dhaka, February 4, 2017, for details see at <https://www.thedailystar.net/op-ed/corruption-bangladesh-perceptions-vs-reality-1355818> accessed on June 25, 2018.
- Haskins, R. (2011). Social Policy in Singapore: A Crucible of Individual Responsibility. *Brookings Institution*. <https://www.brookings.edu/articles/social-policy-in-singapore-a-crucible-of-individual-responsibility/>

- Haque, A. (2017, November 24). Gonotanro Naki Unnoyon, Keno Noy Dui-e (Development or Democracy? Why not two)? *Prothom Alo*.
- Hussain, Z. (2015, 24 March). How Lee Kuan Yew engineered Singapore's economic miracle. *BBC*. <https://www.bbc.com/news/business-32028693> accessed on June 22, 2018.
- Institute for Economics and Peace. 2018. Global Peace Index 2018, see details at <http://visionofhumanity.org/app/uploads/2018/06/Global-Peace-Index-2018-2.pdf> retrieved on June 23, 2018.
- Jahan, R. 2015. *Pakistan: Failure in national integration*. Dhaka: The University Press Limited.
- Jahan, R. 2015. Political Parties in Bangladesh: Challenges of Democratization, UPL, Dhaka
- Jon S.T. Quah. (2017). Singapore's success in combating corruption: lessons for policy makers. *Asian Education and Development Studies*, 6(3), pp.263-274. <https://doi.org/10.1108/AEDS-03-2017-0030>
- Jahan, R. 1994. Pakistan failure in national integration, The University Press Limited, Dhaka.
- Kamruzzaman, M. 2019. Bangladesh mega projects to boost economy, Anadolu Agency, Ankara, September 03, 2019 < <https://www.aa.com.tr/en/asia-pacific/bangladesh-s-mega-bridge-to-boost-economy/1571795>>.
- Khan, M. A. (2013, November 18). Country in Leadership Crisis. *The Daily Star*.
- Khan, M. M. (2003). State of Governance in Bangladesh. *The Commonwealth Journal of International Affairs*, 92(370), pp. 391-405. DOI: 10.1080/0035853032000111116
- Keman, H. (2015, September 21). Polyarchy. *Encyclopedia Britannica*. <https://www.britannica.com/topic/polyarchy>
- Lewis, D. (2013). *Bangladesh: Politics, Economy and Civil Society*. Cambridge: Cambridge University Press.
- Lipset, S. M. (1959). Some Social Requisites of Democracy: Economic Development and Political Legitimacy. *The American Political Science Review*, 53(1), 69-105. doi:10.2307/1951731
- Lopez, G. (2018). Corruption in Malaysia and Singapore. *New Mandala*. <http://www.newmandala.org/corruption-in-malaysia-and-singapore/> accessed on June 23, 2018.
- Mamun, M. A. A. (2016, August 20). Future leadership in Bangladesh: The next predicament, LinkedIn. <https://www.linkedin.com/pulse/future-leadership-bangladesh-next-predicament-mamoon-pmp/> accessed on June 25, 2018.
- Mahbubani, K. 2016. The importance of meritocracy pragmatism and honesty. *The Patriot*, . <https://thepatriot.com.na/index.php/2016/09/09/the-importance-of-meritocracy-pragmatism-and-honesty/> accessed on June 23, 2018.
- Mhbabani, K. (2017, December 6). Why Singapore Is the World's Most Successful Society, *Huffpost*, https://www.huffingtonpost.com/kishore-mahbubani/singapore-world-successful-society_b_7934988.html
- Mahbubani, K. (2013, November 9). Seven pillars of Singapore's soft power. *The Straits Times*. <https://www.straitstimes.com/singapore/seven-pillars-of-singapores-soft-power#main-content>
- Ministry of Education (MoE). (2010), National Education Policy 2010, Peoples Republic of Bangladesh, <http://old.moedu.gov.bd/index.php>
- Ministry of Home Affairs, Singapore, available at <https://www.mha.gov.sg/about-us/key-topics/law-and-order> accessed on June 23, 2018.
- Morshed, A. 2019. Will metro rail solve Dhaka's traffic apocalypse? *The Daily Star*, September 03, 2019, Dhaka

- Nasser, H. (2016, January 26). Will Singapore's honest and pragmatic style of politics ever lead to a multi-party parliament? *ASEAN Today*. <https://www.aseantoday.com/2017/01/will-singapores-honest-and-pragmatic-style-of-politics-ever-lead-to-a-multi-party-parliament/>
- Noraini, M.N. & Chan, H. L. 2013. Multiculturalism in Malaysia and Singapore: Contesting models. *International Journal of Intercultural Relations*, 37(6), 714-726. DOI: org/10.1016/j.ijintrel.2013.09.009
- Overseas Development Institute. (2009). Growth without development: Looking beyond inequality.
- Proclamation of Independence. 1971. Peoples Republic of Bangladesh.
- Quah, J.S.T. (2017), "Singapore's success in combating corruption: lessons for policy makers", *Asian Education and Development Studies*, Vol. 6 No. 3, pp. 263-274. <https://doi.org/10.1108/AEDS-03-2017-0030>
- Quah, J.S.T. (2015), "Lee Kuan Yew's enduring legacy of good governance in Singapore, 1959-2015", *Asian Education and Development Studies*, Vol. 4 No. 4, pp. 374-393. <https://doi.org/10.1108/AEDS-05-2015-0020>
- Rahman, M., Khan, T. I. & Sabih, M. A. 2016. Budget for Education in Bangladesh: An Analysis of Trends, Gaps and Priorities. *Center for Policy Dialogue*.
- Randhawa, P. 2018. Singapore legal system is firm, just and fair, December 21, 2018, *Today*. <https://www.todayonline.com/voices/singapores-legal-system-firm-just-and-fair> accessed on June 23, 2018.
- Riaz, A. 2016. *Bangladesh: A Political History Since Independence*. New York: I.B. Tauris.
- Sargent L. T. 2009. *Comparative Political Ideologies: An introduction*, Cengage Learning, Belmont
- Schmitter, P. C. & Karl, T. L. 1991. What Democracy is and is Not. *Journal of Democracy*, 2(3), 75-88. DOI: 10.1353/jod.1991.0033
- Shyok, S. K. 2019. Flyovers in Dhaka: Are they any solution to traffic gridlock or scraps? The UNB, November 30, 2019, Dhaka.
- Schumpeter, J. A. 1961. *The theory of economic development: An inquiry into profits, capital, credit, interest, and the business cycle*, Transaction Books.
- Schumpeter J. A. 1943. *Capitalism, Socialism and Democracy*, George Allen and Unwin, London
- Sen, A. 1999. *Development as freedom*. Oxford: Oxford University Press.
- Singapore Department of Statistics. 2002. "Changing Education Profile of Singapore Population", presented at *Conference on Chinese Population and Socioeconomic Studies: Utilizing the 2000/2001 round Census Data*. Hong Kong University of Science and Technology. <http://www.singstat.gov.sg/pubn/papers/people/cp-education.pdf>
- Times of India. 2018. MP Modi inaugurates Bogibeel bridge, India's longest bridge, opens for traffic, December 26, 2018, Haryana
- Tharoor, S. 2016. *An Era of Darkness: The British Empire in India*, Aleph Book Company, New Delhi
- Todaro, M.P & Smith S.C. 2003. *Economic Development*, Pearson, 2003
- UNDP. (2000). *Human Rights and Human Development: Human Development Report*
- World Bank, 2013. <http://www.worldbank.org/en/country/bangladesh/brief/bangladesh-governance> accessed on June 26, 2018.
- Wolfson, M. (1997). Divergent Inequalities: Theory and Empirical Results. *Review of Income and Wealth*, 43(4): 401-21.
- World Economic Forum, <http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/#economy=SGP>

Social and Political Capital of People's Institutions in the National Election: The Case of Bangladesh

Hasibur Rahaman *
Md. Abu Saleh **

Abstract: Recent years have shown that EC alone cannot assure free and fair elections particularly in the developing democracies, where the political process is not duly institutionalized. Bangladesh is not an exception. In absence of viable political institutions, people's institutions and its social and political capital play a pivotal role in developing democracies. Some of the people's institutions role is not up to the mark in this regard as they were mostly divided in the party line. Women participant is also a significant area in participatory democracy. Moreover, political mobilization is happened by religion. The painful fact is that it is playing a negative role in politics. Mass-media plays a key role here in absence of institutionalized political process. Ideal Media needs to have responsible and neutral approach in dealing with election coverage as media considered 4th organ of the state. Most importantly, Bureaucratic accountability, impartiality and neutrality are more important to hold the free and fair election. Judiciary also is one of the institutions which have responsible for adjudicating the election disputes prescribed by the electoral law. So, it can be safely said that in the absence of credibility of Election Commission, the agency of people institutions and their social and political capital can play a pivotal role in the way of holding a free and fair election, side by side they also can influence the election outcomes negatively.

Keywords: People's Institutions, Social and Political Capital, Election, Election Commission, Vote and Voters.

1.0 Introduction

This article is devoted to exploring the role of people's institutions and the use of social and political capital in the election. Particular attention is given to studies dealing with the relationship between the presence of social, political capital and performance of people institutions. To hold the free and fair election, the Election Commission and government are not only responsible. Besides Election Commission and government, different social and political institutions are equally responsible for that purpose. The influences of the social and political capital of these institutions are playing a decisive role in the election. Here, the social capital of the institutions "refers to the collective value of all 'social networks' and the inclinations that arise from these networks to do things for each other" (Putnam, 2001:213) and political capital indicates to the capacity of political leaders to influence the consequence of political issues. Social capital and political capital have not always been defined as positive. Sometimes both of these may be negative. The impacts of social capital may be assumed as savage or illegal action which is induced through the reinforcing of intra-group bondage. In this context, Robert Putnam said that "social capital may lead to the bad outcome if the political institution and democracy in a specific country is not strong enough and is, therefore, overpowered by the social capital groups" (Putnam, 2001:213). In the same vein, political capital may

* Assistant Professor, Department of Political Science, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj, Bangladesh. E-mail: hasibjugp@gmail.com

** Assistant Professor, Bangabandhu Institute of Liberation War and Bangladesh Studies, Bangabandhu Sheikh Mujibur Rahman Science and Technology University, Gopalganj-8100. E-mail: saleh.edu@gmail.com

lead to the ability of politicians to influence the outcome of political events negatively. In this context, it can be safely said that social capital and political capital of the institutions are key components in building and maintaining democracy when the government performs well. However, “there are wide variations in levels and forms of social capital between nations, regions within nations and even within individuals. All these variations are probably explained by different factors such as history or culture, dimensions” (European Commission, 2005:5). So, it can be said that building and upholding of social capital and political capital depend on the atmosphere offered by the state and its organization. In this context, the democracy of a state is a product of social capital and political capital. For example, the Netherlands, Switzerland and Sweden have an extensive welfare system in the world. There social and political capital plays a conducive role with the government in all sorts of state activities. In the reverse vein, the social and political capital of Bangladesh plays a negative role in the political process.

2.0 Agencies of People’s Institutions: Social and Political Capital

Recent years have shown that EC alone cannot assure free and fair elections in certain countries. Especially, it is not possible in developing democracy, where the political process is not duly institutionalized. Therefore, different social intra-groups, socio-cultural, political and religious institutions and their social and political capital keep a fundamental role in the process of election of those countries. In this respect, electoral structures and processes specialist Carl Dundas states that “an electoral management body should have the necessary powers and authority to deliver free and fair elections. Any role to be ascribed to civil society, political parties and the media in support of EMB must therefore be in support of this” (Dundas, 2006). The roles of such non-governmental actors in the electoral process of Bangladesh are given below.

2.1 Civil Society

The EC alone does not assure democratic election. Because, it is so presumed that there is no “institution in modern time which is capable of discharging its assigned duties autonomously without the help and cooperation of some other institutions that have some interest in achieving common goals” (Huda, 2008:1). What is the responsibility of civil society in the electoral process of a democratic country? Bruce Gilley mentioned “it has become widely understood that a healthy democracy requires more than elections” (Gilley, 2008:3). Democracy depends largely on the qualitatively supportive civil society (Gilley, 2008). According to this definition, “the term civil society denotes an umbrella of non-governmental institutions which have the common role of advocacy to the society according to their themes” (Gilley, 2008:3). As part of this advocating role in politics, civil society groups press the government to respect the opposition and to rule by consent rather than coercion. As the “civil society leaders are not supposed to replace the political elites by becoming counter elites” (Mendis, 2008:65). Inter-relationship between civil society and due election as mentioned above is needed to be traced in Bangladesh context for democratic qualitative promotion. But it is very difficult to locate.

In Bangladesh, very few civil society organizations have been able to unite for free and fair election because they were mostly divided into party lines. Though the assigned duties of civil society are to help the people to distinguish between political propaganda

and political reality through “educating people to understand and judge for themselves the opportunities and choices in the form of articulation of popular will” (Mendis, 2008:65). During the time of elections, civil society organizations for the sake of democracy need to offer civic education, training for citizens and deploy election observers. But they failed in this respect. On that account, democracy could not have deep roots in Bangladesh. In this context, certain people opine that where there are elections but no active civil society is like “competitive authoritarianism”. Where there are semi-competitive elections and weak civil society government accountability remains weak and very poor. Bangladesh perspective reflects the same. Here, civil society could not or did not play its ideal role to assure good governance and government accountability to the people. In this context, it can be mentioned here that “nearly 200,000 election observers have been engaged by the non-governmental and civil society organizations in the 9th parliamentary election of Bangladesh. That means there is one election observer for every 400 voters. About 700 international election observers were also present. The EC facilitated the accreditation of the national and international observers. Certain national election observation groups were denied accreditation on the grounds of their affiliation with political parties. This is a good practice” (Forum-Asia Secretariat 2009:17). Had the government and BEC expressed unwillingness about the observers’ presence it would have reflected its negative motto.

Not that they are negative absolutes. Some civil society organizations have come forward to help the BEC to create congenial election environment. For example, CPD, TIB and *Sushasoner Jonno Nagorik (Shujan)* are playing a laudatory role to aware mass about their role to choose the right representatives and to educate them to say “No” to the corrupt candidates. This movement will help the Election Commission to be further strengthened, “because if people are aware of the candidates, the party will be forced to select right candidates, then the environment of election will be more congenial” (Akram & Das Shadan 2006:69). The major two political parties in Bangladesh are criticizing such responsibility of these civil society organizations. Regarding the positive function of civil society former Election Commissioner M. Sakhawat Hussain mentioned this in an interview:

Box-1

In 2007-08, many of the members of civil society organization and members of the public went public with suggestions. These include issues like the selection of clean image candidates by political parties, accurate voter registration, reforms of the electoral law, check on the use of hidden money in the election, structural reform of the EC and political party registration for making political parties answerable to the people through the law. The civil society not only increased public awareness but succeeded in pressurizing political parties to accept the notion of reform.

2.2 Mass Media

The mass-media plays a key role in the political process and therefore, the importance of the mass media continues to grow in politics. As Doris Graber defines “media coverage is the very lifeblood of politics because it shapes the perceptions that form the reality on which political action is based. Media do more than depict the political environment; they

are the political environment” (Graber, 2001:210). From this viewpoint, the role of media is very significant in a country like Bangladesh which runs with the poor performance of democratic rule. Media initiatives during the election voluntarily and responsibly in generating voting awareness of the people are recommended. Particularly, the role of media is very important “in informing the public about what the politicians are promising, in telling the politicians what ordinary people want, or do not want, and in ensuring that the polls are free and fair” (Reuters Foundation, 2010). The mass media also plays a significant role to build awareness among the electorate on casting their vote so that the voters choose their representatives rightly. In this perspective, it may mention clearly that in a democratic polity, election turns into a farce without a free media.

Ideal mass-media needs to have responsible and neutral approach in dealing with election coverage. Specifically, state-owned media must maintain this principle strictly. Unfortunately, almost all of the Bangladeshi media favoured certain political parties or candidates. Military regimes strictly manipulate the media for their favour also. Such manipulations become more evident from the schedule of the programs to present election-related news, daily election update and TV talk show. Media is also used by the political government to attack opposition parties or candidates during the election. In contrast to the military government and political government, the media played a comparatively neutral role during the election under caretaker governments from 1991 to 2008 election. In Britain, “the allotment of time on the British Broad Casting Corporation (BBC) depends on the number of candidates set up by each political party” (Ali 2001:154). Major political parties in Britain, which contest almost all the seats, the time are equally distributed among them.

In this respect, the Bangladesh Election Commission (BEC) should prepare a clear guideline so that incumbent government could not abuse media in favour of particular candidates or political parties. The BEC also should maintain smooth contact with the media for ensuring impartial reporting that may tender a positive idea to improve the atmosphere before and after elections. Usually, the newspapers in Bangladesh provide daily coverage of more than one page with the views on the election. The traditional media still dominates in Bangladesh. “With a penetration of 1% of the total population of 145 million, the internet is still not a media that reaches a mass of people” (Forum-Asia Secretariat 2009:17). All most all the political parties launched websites in election 2008 but these were not effective. The uses of the low level of mass media in countryside areas of Bangladesh work as a barrier to circulating the party policies among the voters living in the countryside. Several steps were taken by the political parties to reach those voters by some alternative ways: disseminating electoral pledge through a loudspeaker hung it on cars and rickshaws.

For unprofessional and biased reporting, people lost their faith in most of these media. Some journalist opined that smaller political parties in terms of their representation in the parliament get poor attention of media coverage as it is mostly dominated by AL and BNP. In election 2008, according to media monitoring findings of EU-EOM, which revealed that together with the AL and BNP jointly received more than 60% of space allocated to political parties in the monitored newspaper and more than 70% of airtime on three monitored private TV channels. Since people would like to see the media’s nonaligned role of being the supervisory body of democracy. It is also expected that the

media should play a positive role in restoring people's confidence in democracy. From an example, since the last general election, a programme on a TV channel titled 'may we know with due respect'. Most of the political parties were requested to articulate their opinions on a range of issues through a question-answer session which engrossed mass people's attention and had wide applause. But there were also mixed views regarding the neutrality of media in Bangladesh. According to the ANFREL report revealed that almost 60% of Bangladeshi believe that the media is always neutral, but 20% believe that it is neutral only for some time and 10% believe that it is not neutral at all (ANFREL, 2008:94). Regarding the role of media Prof. Naseem A. Hussain said this in an interview:

Box-2

The democratization of political culture through political institutions having strength and capability to mobilize the people as well as to diffuse political education has not taken deep roots in Bangladesh. However, people in Bangladesh have historically gathered a belief that neutral media can be played an important role in democratic elections. Of course, voters are the important actors in elections, but media can play a role for improving the quality of elections by educating voters, help them understand, debate, create public discourse, make a choice of candidates and priorities for political parties. As elections are a process media's vigilant observation is required for the entire pre-election period and post-election development and of course what happens on Election Day. But in Bangladesh, it is observed during elections in particular that independence of media is under attack and there are attempts to silence critical media voices. The media are controlled for favourable coverage to serve the partisan interests of the power holders or commercial interests rather than public. Thus, during elections, people are deprived of unbiased news and information mostly required exercising their right to representation. Social media are also controlled for their rapid reaction, greater reach and effective influence. Erosion of the freedom of media is a symptom of the curtailment of the freedom of expression and breakdown of the democratic electoral process.

2.3 Religion

In the post-colonial history of India-subcontinent, religion plays a significant role in political mobilization. In the light of this, "it is crucial to focus attention on the support for the various political parties according to the religious affiliation of the voters to analyze if it forms the ground for political discrimination" (Prakash, 2008:377). In terms of population, Bangladesh is the third-biggest Muslim country. The constitution of Bangladesh mentioned clearly about its secular status, yet, religion has to become a vital factor in the politics of Bangladesh. Therefore, the issues of religion and politics became intertwined from the British colonial rule in South-Asia. During British colonial rule, religion maintained as to divide Hindu and Muslim communities of colonial India. As part of divide and rule policy, the partition of India sub-continent was based on religion. After the inception of the two states, India, as well as Pakistan, the confrontation between them, became intensified further, and political use of religion came into being.

AL led the struggle for independence based on Bengali nationalism, not religion. After the independence of Bangladesh, the state making process has completed through Bengali nationalism. Simultaneously, newly born independent Bangladesh became the merely homogeneous state in South Asia with almost a single similar language and with few ethnic and religious minorities. Bengali nationalism worked as a linchpin between the mainstream (Bengali Muslims) and the minorities. In this type of nationalism, minorities were not undermined. Therefore, Bangladesh has a unique cultural and religious trait. Ethically, 98% of the population is Bengali. Bengali is predominantly Muslim. Hindus are the largest minority group, is approximately 10% of the total population. As recognition of this trait, constitutional provisions state that “all citizens are equal before the law and are entitle to equal protection of the law.” As per the provision of the constitution (Article 28), the “state shall not discriminate against any citizen on grounds only of religion, race, caste, sex or place of birth.”

However, for the first time, sectarian politics emerged in Bangladesh through the enactment of the *Vested Property Act* in 1974. It has made the Hindu secondary citizens. Local politicians exploited them by using this Act. The effect of this Act was that it increased the migration of Hindus to India. The Hindus developed a perception that Bangladesh was not their country. Therefore, after independence, many Hindus migrated from Bangladesh to India. Bangladesh's political system has undergone further transformation when Zia curtailed secularism from the basic principles of Bangladesh's constitution and “made the recitation of verses from the Qur'an a regular practice as meetings with his newly formed political organization, the BNP” (Lintner, 2002). General Zia also introduced a new brand of nationalism with Islamic flavour instead of Bengali Nationalism. Bengali Nationalism based on Bengali language movement, not religion. The sectarian politics became stronger when the rights of religious minorities have undergone structural changes of the constitution during the regime of General Ershad. Ershad included Islam as the official religion of the state with the 8th Constitutional Amendment. Except for Muslim, the other minority communities feel that this has significantly undermined all other religious and ethnic identities. After that Islamic forces consolidated their influences in politics and religion became a tool for attaining political gain.

Not only in Bangladesh, political use of religion, has become a common phenomenon in other South Asian countries also. For instance, almost all south Asian countries except India have made institutional provision of religion in their respective constitutions. Pakistan inserted Islam as a state religion; Sri Lanka declared themselves as Buddhist and Nepal as a Hindu state. To some extent, India is different from this notion. India has deceptively made secularism as state principle in her constitution. But in its cultural details, Hinduism is prior with great and determinative impact on Indian politics. All of the South-Asian countries, the power elite have used the religion for consolidating their power.

This situation has created a far-reaching negative consequence in the political system of Bangladesh. In this context, it has also been argued that after the re-enforcement of democracy in 1991, “the political leader and civil-society actors have only focused on ensuring the continuation of free elections whereas issues related to the inclusion of meaningful participation were not given serious attention” (Mendis, 2008:319).

Furthermore, the majoritarian tendency of the electoral system of Bangladesh (First Past the Post) has made it difficult for effective representation in the political system. In the absence of effective representation, the Electoral System instigated the criminalization of politics and it has also increased social cleavages. As mentioned earlier, the FPTP system of election is the simplest form of the majority system. In such a system, the winning candidate secured the highest votes. Therefore, "factors such as close competition between the two dominant parties as well as the presence of a significant number of Hindu voters may lead to the targeting and victimization of minorities because the election results can be altered if a significant number of minority voters can be prevented from casting their votes" (Mendis, 2008:324).

In the way of creating social cleavages, religious identity, slogans and symbols have often been used by political parties for political gain. The religious voice in the political arena is acclaimed by some communities but is deeply troublesome to other communities. In this reason, the religious leaders (head of the different religious institutions, such as the principal of Madrassas, imam of Mosque) gradually uphold an influential role for religion in electoral politics. Therefore, certain religious communities are belonging to certain political parties in the election for protection of their religion. From this notion, Bangladesh is not an exception. In this context, it is to be cited here that there is a popular perception in Bangladesh that the Hindus are a vote bank for the Awami League. This perception creates further discrimination in the electoral process. Since religious minority communities are considered as Awami League supporters, the opposition party activists tried to intimidate them from the voting in Election Day. As part of this intimidation during the pre and post-election phase, minorities are systematically targeted and victimized. It is worth mentioning that no political party even Awami League not tried to pass any special law to ban religion politics in electioneering. In this respect, the Law Minister of Bangladesh, Shafique Ahmed, recently said that "no special law needs to be passed to ban religion-based politics." Regarding the role of religious faith in election, Journalist Mizanur Rahman Khan mentioned this in an interview:

Box-3

The use of religion especially in the electoral campaign is an old fashion in the politics of Bangladesh. Those who do politics particularly in the name of religious faith, their foremost target is to earn popular support. Nevertheless, they are well known that individuals are pious utterly. But they are not eager to see them in power because they form parties in the name of religion. So, traditionally the power of 'religious politics' lies primarily on the AL and BNP. The AL prefers secularism, while the BNP prefers the road to religion. But, most imperatively, the two major parties are in a race to make the reflection of Islamic sentiments in their policies or election campaigns. In the politics of voting, they are not more than 12/13 per cent including Jamaat. But they are the king-makers. These two major parties are so religious in their politics that the code of conduct enacted by the Election Commission in this regard is always violated. But the two big parties can't take appropriate action. There has been a huge spread of Islamic ideology in society as a whole. And that reality is echoed in the policies of the two key parties. But it could also be the result of systematic long-term use of religion in electoral politics.

2.4 Social Groups

The social group is formed based on social capital. Social capital refers to the “people who have an extensive social and associational life are more inclined to trust other people, to think in terms of ‘we’ instead of ‘I’ etc.” (Putnam, Leonardi, & Nanetti, 1993:258). According to that notion, social groups may contribute to social capital, not because, it stimulates people to become involved in the political process, but because, it brings people into contact to obtain their common goals. Social contact creates space for an individual to gather information about politics that allows them to live beyond personal resource constraints, thereby supporting the political activity of many people. According to the theory, “social groups are perceived to be connected with varying degrees of intensity, to different political parties and individuals’ evaluation of those groups influence their orientation towards political parties and candidates” (Miller & Wlezien, 1993). “This group orientation to politics makes a good deal of sense because social groups are very visible actors in electoral politics” (Miller & Wlezien, 1993). The social groups connected with each political party could be assessed more positively while others assessed more negatively. The role of social groups in electoral politics whether positive or negative, they still played a significant role in the election. By choosing the candidate in the election, social groups may reflect the participation of the groups themselves.

There are different social groups active in Bangladesh. Most influential and organized social groups in Bangladesh exist only among the 16 per cent of the population who live in urban areas. These groups include the student community, trade unions, businessmen, middle-class professionals, the military, and the civilian bureaucracy. In 1971, “Bangladesh were urban-based business groups, political, bureaucratic, and military elites have dominated the political process” (Kochanek, 1996:704).

Shortly after the independence, despite the nationalization of key sectors, Bangladesh has developed family-based new business groups. Many of them are drawn from prior established business families. These business group received patronage from the government through contracts in construction, supplies and distribution. For getting this opportunity they had to maintain a close relationship with the bureaucracy. Therefore, a new era of the business-bureaucracy relationship was started. Besides this group, a large number are new business groups that have benefited from the successive military governments of Bangladesh. It has been observed that during the military regimes, the business and industrial groups were promoted in the political arena. Both of the groups were politically connected by family, marriage as well as a business relationship. The leaders of the new industrial elite were active in politics and business association. These new industrial elite still are active through individual connection or associational connection in politics. Since, they have a concentration to economic power, based on this power, they play important role in the political process as well.

After the re-emergence of the democratic process in 1991, it has been observed that the major political parties provided their nominations to a group of people who have ability to the spent huge amount of money for nomination purpose without having any political background. Therefore, “the people who have a long political career failed to get their party nomination due to their financial weakness” (Karim 2004). Money has become a useful tool in winning the election and the business-industrial elite have become a

powerful actor in the electoral process. A table comprising different social groups' representation in the JS is given in the table below:

Table 1: Social compositions of the Members of the Parliament (MPs)
(Mahiuddin 2010, p.208)

| Social Groups | 5 th JS (%) | 7 th JS (%) | 8 th JS (%) | 9 th JS (%) |
|---------------------------------|------------------------|------------------------|------------------------|------------------------|
| Business-Industrial Group | 53 | 48 | 57 | 56.33 |
| Army Officers | 6 | 6 | 5 | 5 |
| Former Civil Servants | 2 | 2 | 3 | 4.67 |
| Lawyers | 19 | 17 | 11 | 14.67 |
| Doctors, Engineers, Journalists | 14 | 9 | 11 | 6.67 |
| Professional Politicians | 2 | 4 | 7 | 5.33 |
| Others | 4 | 14 | 6 | 7.33 |

As illustrated in the table, the rate of representation of the professional politicians in both 5th, 7th, 8th and 9th parliament is very low compared to business-industrialists and army officer's representation in parliament. The percentage of presentation in 1st JS by the business-industrial class was only 24 %. In 5th parliament, the percentage of representation by the business-industrial class was 53 %. According to Maniruzzaman, "this class comprised 66% legislators in BNP, 51% in AL, 63% in Jatiya Party" (Maniruzzaman, 1994). The business-industrial class has highly increased in the 5th JS from 24 % to 53 %. The 47% members of 7th JS came from the business-industrial class while 57% of members of 8th JS and 56.33% members of 9th JS came from business-industrial class. This trend indicates that the business-industrial class is gradually increasing in Bangladesh Parliament (JS). It is alarming to note here that TIB stated in its report "the members mostly remain absent in the parliamentary session are the business-industrialists. They spent most of their time taking care of their business rather than parliamentary activities" (Ahmed 2005). But, why political party gave the nomination to such persons in the election? Political parties gave the nomination to that person who can spend a huge amount of money to win the election. In this way, since the independence of Bangladesh, according to Kochanek, "the professional businesspersons have gradually got involved in politics resulting in their higher representation in the JS" (Kochanek, 2000).

In the liberation era, after the military coup by some derailed army officers and brutal assassination of father of the nation, Bangabandhu Sheikh Mujibur Rahman in 1975, the military played an active role in Bangladesh politics. Since the military has a glorious role in the war of liberation, the military wished to play role in the country. This process of politicization of armed forces, Harry Benda says, "having played a significant role in the liberation of their countries and having gained access to military power, they have also created a set of political followers both among their subordinates and quite often, among the public at large" (Masoom, 1996:96). This kind of motivation plays a vital role in the political processes of successive regimes of Bangladesh. Statistics show that in the first in the Bangladesh Parliament (JS) only 2 members came from the civil service but

no members came from a military background. If we look at the 5th JS, 6 MP came from civil service and 17 from military service.

In rural areas, social groups are based on patron-client relationship. This patron-client relationship is mainly dominated by landowners. They are less organized and less important social groups. However, the patrons try to bring up the clients under their sphere of influence. Based on this sphere of influence, they become powerful actors in the political process. In recent years, in a traditional society like Bangladesh, these social groups are organized mainly by NGOs. There are thousands of social groups “spread throughout the countryside but they remain highly localized, non-political, and primarily concerned with poverty alleviation” (Kochanek, 1996:704). These social groups have played a very limited direct role in the electoral process. In the recent scenario, “the Islamists groups have emerged as kingmakers within mainstream electoral politics, like-minded religious groups and educational institutions have gained greater influence” (Bertelsmann Stiftung, 2010:3). These religious groups have a close connection with the central religious-based political party. They wish to replace the democratic state with a religion-based political order.

2.5 The NGOs

In recent years, the role of NGOs has been increasing in most of the developing countries. In Bangladesh, the NGOs were born in the 1980s as the social organizations. Primarily their tasks were poverty alleviation, and health care and education. Since then, the number of NGOs of different varieties began to emerge. They became most active in rural areas for empowering marginalized groups. But, “a new movement of NGOs has arisen since 1988 to fight for transparent political processes and political accountability, and to build a democratic culture among citizens” (Bailey, 1998:3). Most of these NGOs are divided into party lines. In some cases, NGOs also have been accused of involving direct political activities. How did they emerge as a powerful factor in society? According to Chowdhury “this increasing involvement of NGOs in various sectors, has made the public indifferent toward the roles played by government organizations” (Chowdhury, 1990). Concerning government organizations, NGOs have become much institutionalized in various sectors. Besides that, in most developing countries, NGOs emerged as a politically powerful and influential factor, “especially because of their external sources of financial support and cooperation” (Haque, 2002:411). According to M. S. Haque, “another indicator of the increasing power of NGOs as social organizations is the fact that the majority of their members are women who represent a formidable political force as a group participating in elections and shaping the election outcomes” (Haque, 2002:420). In some cases, NGOs support a certain political party to win in the election by expenses their social capital as well as a huge amount of money. Based on this political strength, NGOs intend to achieve the “goal of influencing policy decisions and shaping global political perspectives on issues” (Steinberg, 2003:23). In recent years, Islamic NGOs have begun to establish its networks in rural areas through which they trying to implement their agenda to make a religion-based political order in Bangladesh.

In the past, the NGOs were very much reluctant to play any role in the electoral process. The electoral process of Bangladesh was typically performed by government officials. In recent years, the NGOs were involved in the election observation mission and the voter

enrolment process. The BEC appreciated the NGO communities to provide their assistance in the voter registration process and signed a memorandum of understanding along with EWG (Election Working Group comprising of 34 NGOs) to involve them into electoral process of Bangladesh. Regarding the role of media Prof. Naseem A. Hussain said this in an interview:

Box-4

Non-Governmental Organizations (NGOs) in Bangladesh do not legally have engagement with formal political activities and for this reason, their initiatives for democratization particularly in elections are not valued as having a political dimension. Besides working as a platform for interaction, coordination and mobilization of the people NGOs are actively involved in varieties of activities during elections like monitoring various parts of the electoral process, voter registration, media access, fairness, campaigning for finance, election violence, the candidates and parties standing for elections, women in politics and other election-related issues. The inability of the institutional political order to reach all sections of the people has given rise to NGOs to perform political roles for the poor and marginalized groups in the society. NGOs constitute a new and alternative structure to the traditional and prevalent social form of patron clientelism in rural Bangladesh and the poor beneficiaries are trapped in organizational dependency. As Non-State Actors, NGOs constitute a part of civil society associations which seem to aggregate and articulate mass opinion and preferences. Nevertheless, NGOs are not independent civil society actors as they depend on donors for financial resources, do not practice internal democracy and are accountable to foreigners.

2.6 Political Party

The political party is an organized group of citizens who work closely as a political unit of a country. As Soltau quoted, "Political parties cut roads, as it were through the jungle of conflicting individual opinions, each road offering either a separate destination or separate ways of reaching an agreed goal. But without these roads, the electorate would wander aimlessly and effectually" (Ali, 1996:175). Therefore, Sigmond Neumann has identified political parties as to the 'lifeline' of modern politics (Neumann, 1996:1). It is impossible to think of the effectiveness of a democratic system without political parties. Without competitive and effective political party democracy become a symbol for legitimizing the state power. However, the role of a political party may not be assumed without considering the existing political culture and societal characteristics of the country. South-Asian countries are belonging to more or less homogenous political culture and traditions.

The nationalist movement in the erstwhile colonies of Asia "which were directed towards achieving independence through the participation of various classes and groups, in most cases, could not evolve into political parties" (Hossain, 1988:27). In this reason, the new countries of Asia had not been able to institutionalize the political parties. G.W. Chowdhury pointed out in following words, the political parties in a new state "trend to cluster around personalities, rather than to represent any ideology or interest. In most cases, it was a leader organizing a mass following and not a mass movement producing

its leaders. the *personalise*-the tendency for political groups, to be organized in support of particular leaders is a common feature in the new states” (Chowdhury 1988). South - Asian countries are not an exception from this notion. In the context of Nepal, Lok Raj Baral and Leo E. Rose opined that “politics is still based on personality than institutions; the leadership roles within the government and parties are personalized and lack accountability”, and when crises accumulate due to the failure of institutions and leaders, the elected representatives including the leaders of government find themselves stuck with the environment. This “functional and behavioural crises severely hinder the process of institutionalization and legitimization in the country” (Baral & Rose, 1998:213). As a result of this consequence, for dynastic rule within political parties of South-Asia, the leadership remains highly personalized and centralized around the founding family’s members. Bangladesh is not an exception to this notion. After the independence, Sheikh Mujibur Rahman, the architect of Bangladesh, introduced British type of parliamentary system. However, Sheikh Mujibur Rahman remained in the position of Prime Minister (PM). It is to be noted that as long as Sheikh Mujibur Rahman was alive, “he was much more than a Prime Minister.” It was the reality that had a pro-long effect on democracy as well as party building process of Bangladesh. Since independence, the most popular party, AL dominated the political scene of Bangladesh. But, within a very short time, the AL government had failed to fulfil the desire of the people due to the material conditions. In such circumstances, people became disappointed with the process of development. They saw stagnation in the course of social, administrative and economic conditions. This politically disappointing situation makes those countries victims of military interventions. The armies in such circumstances take this opportunity. After the brutal assassination of father of the Nation Bangabandhu Sheikh Mujibur Rahman in 15th August 1975, martial law was imposed in the country. Democracy and basic rights were snatched away. From there began the politics of killing, military coups and counter-coups. Through the coups and counter-coups, in November 1976 Major General Ziaur Rahman assumed power of the Chief Martial Law Administrator (CMLA) and subsequently in April 1977 he became the president and formed the political party-BNP, it became another major political party in Bangladesh politics.

The subsequent decades after independence, Bangladesh witnessed a turmoil situation related to the state affairs which may identify as undemocratic, unconstitutional, despotic regimes. The muscles power, black money and ascribed pattern of party leadership become the major characteristics of politics in that time. Besides, party chiefs became unchallenged as all the power vested in his/her hands.

2.6.1 Democracy inside Political Party

The area that deserves significant consideration is democracy within the party. The leaders of a political party are supposed to be democratically elected. Without having democratically elected party leaders democracy is impossible within the party or in the state. Democracy “inside the party is important for developing an elected and transparent hierarchy, selecting top leadership and their colleagues by party workers and field-level leaders and finally establishing a transparent system and procedures for changing the head of the party periodically” (Rahman, 2008:24). In this respect, it is a widely accepted notion that there is little democracy in major political parties in Bangladesh. It is not

possible to ensure democracy within the political party in a country where the individual leadership roles in the government and parties are personalized and centrally focused. The major parties are dominated by individual leaders and their families, such as Khaleda Zia of BNP, Sheikh Hasina of AL and General Ershad of JP. Nepotism is present at almost every level of these political parties. The features of nepotism within the political parties in Bangladesh are given below:

Table 2: Nepotism inside political parties (Khan, Islam and Haque, 2008)

| Prevalence of Nepotism | Nepotism (Respondents in %) |
|------------------------|-----------------------------|
| Very widespread | 32 |
| Widespread | 51 |
| Not very widespread | 16 |
| Don't know | 01 |
| Total | 100 |

As the table demonstrates that during the formation of national-level committees, the political party gives priority to those political leaders who have a close connection with the party chief or other central leaders. According to the table, 32% of respondents say that nepotism has very widespread effect in getting the post in the national level committee of the political parties. 51% of respondents say that nepotism has a widespread effect in getting the post for the same committee of the same political parties. Only 16% of respondents say that nepotism has not very widespread in getting the post in the national level committee of the political parties.

The constitutions of major political parties prescribe more or less democratic rules relating to the election or selection of party leaderships. There is a big gap between what it is laid down in the party constitution and how party works (Suri et. al. 2007:90). According to Article 8(Ka) of the BNP's constitution that "the party chairperson will be elected by direct vote of the members of the National Council for a term of two years, and the chairperson can be removed if two-thirds of the national council members demand so and three-fourths of the national council members votes in favour of this demand" (Mahiuddin, 2009:104). But it has been observed that after 16 years BNP held its national council on 8th December 2009. The council was held when the party began to be criticized for lack of democracy inside the party. According to the provisions in the BNP constitution (amended in August 2009), the National Executive Committee and Standing Committee are to be formed through election during the national council. During the council, Begum Khaleda Zia was re-elected as the party's Chairperson. But the council was vehemently criticized by many as it empowered re-elected party chairperson Khaleda Zia to pick other members for the National Executive Committee and Standing Committee, ignoring the party charter that stipulates election to the posts. Moreover, the BNP National Council elected Khaleda Zia's son Tarique Rahman as a Senior Vice-Chairman in a move designed to smooth his path to the party helm. The BNP's founder General Zia's Widow Begum Khaleda Zia had inherited the party leadership as Vice-President in 1983 and one year later she became a president of the party. After long 27 years, she still acts as chairperson of the BNP.

In the same vein, Article 21 of the AL Constitution states that “the president, presidium members, general secretary, departmental secretaries, and the treasurer must be elected by the triennial council”. For the election of party office bearers, the ruling AL held its national council session on 21st December 2019 and elect new leadership to guide the party for the next three years. The re-election just follows a proposal and support from the councillors, but in fact, there is no alternative leader to contest the position, or no leader to propose an alternative person in the position. Sheikh Hasina was re-elected as AL President. This election reflects the fact that the party process did not allow to grow alternative leadership. Personalism of leadership led to ascribed leadership pattern which impeded the proposition for and availability of alternative leadership. A brief description of the internal democratic situation of the political parties of Bangladesh is given in the table below:

Table 3: Democracy inside political parties in Bangladesh (Khan, Islam and Haque: 2008)

| Reasons | Percentage |
|---|------------|
| Excessive domination by individual leaders | 47.3 |
| Lower-level leaders are not involved in the decision-making process | 33 |
| Party is run by a coterie | 6.2 |
| Lack of democratic norms in the party | 1.1 |
| Dynastic politics prevails in the party | 0.3 |
| Others | 1.1 |
| Don't know | 11 |
| Total | 100 |

The table reveals that there is no internal democracy that exists in the major political parties in Bangladesh. Our politicians do not practice democracy within their political parties. Party democracy is sterilized as the decision in the party is not taken by democratic means, rather by the party chief. According to Article 70 that “makes mandatory for the parliamentary members to be loyal to their parties” (Mahiuddin, 2009:110). This way the article snatched away the democratic right of the MP. Expecting free and fair election in such perspective is an elusive dream.

2.6.2 Political Party Financing

The party funding of Bangladesh is non-transparent and non-accountable. The mass people of the country are remains in the dark concerning finance of the political party. Even no political party members know the source of their party financing. In the absence of “any clear-cut and transparent party financing system, the party had been free to collect funding from any source” (Hasanuzzaman, 2009:30). There should have restrictions on external financial support in competing parties or candidates from governments of other countries, governmental organizations and international institutions, and national public enterprises. Moreover, a fund can be established by the state in the name of ‘State Budget Campaign Fund’. Anybody or organization may

contribute to that fund to financially support the electoral campaign of all participants. According to the article 90F (1) of the *Representation of the People Order (Amendment) Act, 2009*, “a registered political party can receive donation or grants from any person, company, group of companies or non-government organizations except the sources mentioned in clause (1) of Article 44CC of the same act”. The limit of donation, in the case of a person, at Taka 5 lakhs, and in case a company or organization, at Taka 25 lakhs, which is hardly followed by the political parties where black money and muscle power ruled. The provision is the limit of election expenses at Taka 5 lakhs, which always crossed the limit in the previous elections because of unfair political competition. Therefore, the election expenses have been increased by the *RPO (Amendment) Act, 2009* from 5 lakhs to 15 lakhs. The RPO of Bangladesh required both parties and candidates to submit accounts of their electoral expenses to the BEC and the Returning Officer (RO) after the election. According to Article 44C of the RPO, “the political parties have to submit expense statements within ninety days of the completion of the election in all constituencies”. In the 8th parliamentary election in total 1,921 candidates from 52 political parties took part but no political party submitted its election expenses. Unfortunately, The EC did not take any measures against such violation. Political parties' expenses in the ninth parliamentary election are given in the table below:

Table 4: Expenditures of political parties in the 9th parliamentary election.
(Eicher, Alam & Eckstein: 2010)

| Party | Constituencies Contested | Expenditure Limit (BDT) | Reported Expenditure | |
|--------------------------|--------------------------|-------------------------|----------------------|---------|
| | | | BDT | USD |
| BNP | 260 | 45,000,000 | 44,950,000 | 656,684 |
| Awami League | 264 | 45,000,000 | 36,026,974 | 526,325 |
| Jamaat-e-Islami | 39 | 7,500,000 | 7,472,408 | 109,166 |
| Workers Party | 05 | 7,500,000 | 1,475,000 | 21,549 |
| Jatiya Party | 49 | 7,500,000 | 1,367,000 | 19,971 |
| Bangladesh Jatiya Party | 12 | 7,500,000 | 924,500 | 13,506 |
| Liberal Democratic Party | 18 | 7,500,000 | 0 | - |
| Jatiya Samajtantrik Dal | 07 | 7,500,000 | 0 | - |

As the table demonstrates that parties' expenditures in the 9th parliamentary election were lower compared to their limit expenditures fix-up by the BEC. The reported expenditure does not represent the real picture. This account of expenditures had been given by the parties to the BEC just to meet the RPO's requirements. As we know that more than two hundred new faces had been given nomination in the 9th parliamentary election, most of them were 'business-industrialists' class. As mentioned earlier, political parties had given nomination to that person who can spend a huge amount of money to win in the election. Thus, the 9th parliamentary election has been characterized by 'money investing game'. In this game, the man he who can invest a huge amount of money, deserves nomination from the parties to win in the election. It is interesting to note here that at the time of election 2008, it is reported that candidates sometimes apply to more than one party for

being nominated. In fact, in one race in Bangladesh, three parties had held up announcing their candidate waiting for the person to make his final decision. Thus, leaders from the pure political background were not considered for party nomination due to financial constraints. In this way, the use of black money is increased in politics and black money owners in that way involved in politics in general and parliament in particular.

2.6.3 Women Representation in Political Party

Representation is the core concept in the arena of politics. It is about who represents, and how it is represented. The context of Bangladesh politics provides the usual background in which women is discriminated in many areas of representation. In Bangladesh, women comprise nearly half of the total population. Since women comprise half of the total population, they deserve to get the right to represent half of the decision-making body. Through equal participation in politics, women can play a pivotal role in their general process of advancement. Now the advancement of women is one of the main objectives in Bangladesh. To achieve this objective certain provision are required to be made in the political parties and the political system congenial to representation. As such, *Representation of the People Order (Amendment) Act, 2009* has made a provision for a political party to ensure women representation. The provision proposes that 33% of positions in all committees in the political parties have to be kept reserved for women. It fixed the time frame for achieving the goal by the year 2020 (GoB, 2009). In this regard, suggestion can be put forward that the reserved seats in the parliament should be filled through direct election. Through the direct election, women can be truly represented and recognized in the democratic process.

2.7 Election Observer Groups

The Constitution confirms the voting as a fundamental right of a citizen of Bangladesh. The Bangladeshi citizens will have the opportunity and responsibility to exercise their right when elections are held. In the way of ensuring this opportunity and responsibility of the citizens, the EC and the government have prime responsibility. As a responsible institution, the Government and the Bangladesh Election Commission (BEC) can involve several countries and international organizations as observers to monitor the electoral process in the country to promote a credible election. Election observation is one of the methods by which the transparency of an election can be ensured. Neutral observation of the electoral process can also help ensure the credibility and impartiality of the elections. In addition to ensuring credible and impartial election, “the presence of election observers builds voter confidence in the integrity of the process as well as the integrity of an electoral management body. Election observation also helps to deter or expose violence or intimidation, as well as cheating or manipulation of the vote or election results” (The National Election Commission of Sudan). But, there is widespread disappointment and dissatisfaction in the election observation process in Bangladesh. However, for the first-time election observer groups were allowed in election 2001.

Election observation in Bangladesh is only concerned with a particular election result, but it should be concerned with electoral outcomes. In Bangladesh, Election Observation Groups focus on Election Day only. Therefore, the observers’ report is based on some selected polling stations. Monitoring election should start with the electoral preparations

by political parties and the Bangladesh Election Commission (BEC) (Mendis, 2008:67). This process of observation includes voter registration process, logistic support, the nomination of candidates, campaigning, polling, counting, the announcement of results, and processing of complaints and disputes and so on.

Pre-poll monitoring is limited in Bangladesh. In the case of the ninth parliamentary election, international and local human rights organizations as election observer groups were deeply concerned with the election process. As *Odhikar*, a member organization of Forum-Asia election observer groups in Bangladesh has published data regarding the pre-poll violence during the period 14-24 December 2008 in 40 districts. Its report state that of the 40 monitored districts, the total number of incidents of election-related violence recorded from 14-24 December 2008 was 74. Based on its findings, the ninth parliamentary election held in 2008 was peaceful and fair in general.

The election observer groups in Bangladesh provided by NGO are non-professional and allegedly partisan. Donors offer a huge amount of fund to NGOs for educating voters on the electoral process. The observer groups are failed to this job because of their partisan activities. In light of this, the EC should have a clear guideline to train observers for educating the voters and monitoring the election neutrally. Therefore, the EC should have been facilitated the accreditation of the national and international observers. Partisan election observation groups should be denied accreditation on the grounds of such partisan activities. In the 9th Parliamentary election, nearly 200,000 election observers have been engaged (Mendis, 2008:17). Some of the national election observation groups were denied accreditation on grounds of their affiliation with political parties. This was a good practice of EC. The EC should encourage election monitoring by neutral persons or groups to promote a free and fair electoral process (Mendis, 2008: 66-67). In an interview, Journalist Mizanur Rahman Khan mentioned this:

Box-5

The presence of international observers in the elections was very important in the 5th parliamentary elections in 1991. The reports of domestic and foreign observers were gaining importance in the elections of the non-partisan caretaker government. But after abolishing the 13th amendment, this trend was interrupted. In the 2008 elections, an 800-member EU election observation team lastly arrived in Dhaka. In subsequent elections, they were discouraged to observe. The January 5, 2014 election was one-sided. Although a few observers arrived, EU observers did not. The same continuity can be noticed in 2018 as well. The electoral system is in question, observer groups and their reports have slipped away.

2.8 The Bureaucracy

Bureaucracy dominated most of the developing society's politics and administration. As it is deemed that in post-colonial societies the bureaucracy is the successor of colonial administration. Therefore, Bengal's politics from the very beginning of the British days until the emergence of Bangladesh had been dominated by the colonial type of bureaucracy. The main functions of the colonial bureaucracy were to collect land revenue and maintain law and order on behalf of their colonial master. Since the colonial ruler

was dependent on the bureaucracy; therefore, bureaucracy enjoyed freedom. As Hamza Alavi pointed out that “bureaucracy was one of the instruments of the colonial power whose principal functions were to undermine and subordinate the various indigenous social classes and to repress the nationalist movement on behalf of their colonial masters” (Alavi 1972, quoted in Mahiuddin 2009:15). In this respect, Muzaffer Ahmad mentioned that “in colonial countries, the civil services were called the steel frame of governance” (Ahmed, Muzaffer, 2008:65). After the partition, administration and bureaucracy in new state Pakistan had more influence over politics and politicians in the overall running of the country following the British colonial tradition.

After the independence of Pakistan in 1947, the bureaucrats established themselves in a strong position without any interference from the side of politics and politicians as well. As long as Mohammed Ali Jinnah, the father of the nation was alive, “he was Pakistan” (Sayeed 1967, quoted in Mannan, 2005:226). He was a great leader than administrator and he had virtually no experience in administration. Thus, the bureaucracy becomes a “real government” (Choudhury 1963:2). Therefore, political institution-building and the development of democracy have been affected by such juncture. After the death of Jinnah, particularly during periods of non-democratic military regimes, the grip of bureaucracy became deeper and captured a role making position in the political scene of the country. In the decisions involving basic political, economic and social issues, the bureaucracy in association with the military played a decisive role. Many senior bureaucrats (like Ghulam Mohammad, Choudhury Mohammad Ali and Iskander Mirza) moved into key ruling positions before imposed the first Martial Law. During the Ayub decade, the bureaucrats had a special role in the national decision-making process. General Ayub Khan sought to “legitimize military rule by holding a referendum on himself in 1959, an election to choose an electoral college of 80,000 individuals to be called basic democrats, and an indirect election to the Parliament with the electoral roll limited to basic democracy” (Khan 1997). Basic democracy functioned under the direct supervision of bureaucrats. Furthermore, Ayub Khan expressed a negative attitude to the political parties and politicians. Therefore, he had to maintain close ties with civil-military bureaucrats.

Despite the war of liberation, Bangladesh did not get rid of the grip of inheritably organized bureaucratic and military structures. In this way, the bureaucrats appeared to be an important partner in exercising state power (Hasanuzzaman, 1988:53). Not only military governments, but all successive “democratic governments also depend on bureaucracy because of lack of education, capacity, farsightedness and leadership quality” (Ahmed, 2008:65). Bureaucracy thus remained unaccountable to the political institutions since the emergence of Bangladesh to till today.

Bureaucratic accountability, impartiality and neutrality are more important to hold the free and fair election. Efficient conduct of elections depends on how the polling personnel conduct the poll efficiently. In holding a free, fair and efficient election, field-level bureaucracy plays a significant role. Field level bureaucracy is directly involved in conducting the election. An effective bureaucracy can be ensured through critical and continuous changes. It is also thus imperative to find ways in which political institutions can be institutionalized containing the representatives of the masses. Furthermore, bureaucratic over participation should be reduced, and it has to be brought under political

control. For doing that the politicians need to have due education, capacity, and farsightedness of political leadership and knowledge as to how the political leadership behaves.

2.9 Judiciary

Judiciary is one of the institutions that can help the Election Commission in maintaining its independence, strengthening its functions and interpreting electoral laws for the sake of conducting a free and fair election. In an election, the judiciary can function “where the electoral process is perverted either by the prevalence of the corrupt practice in any form or the disqualification of a candidate etc. is likely to be questioned either by a defeated candidate or any elector” (Ali, 1996: 337). It may bring back people's faith in the electoral process. Therefore, it is essential to have a prompt and unbiased arbitration of election disputes. Judiciary is one of the institutions which have responsible for adjudicating the election disputes prescribed by the electoral law.

According to RPO, 1972, “an election petition shall be presented to the EC within 45 days after the publication in the official gazette of the name of the candidate. The EC will then arrange for the submission of the election petitions to the concerned Election Tribunals constituted for the purpose by the EC”. To resolve the election disputes of the parliamentary election, there is a system of the writ petition to the High Court Division as Election Tribunal. According to Article 57(6) of RPO, “the High Court shall endeavour to conclude the trial within six months from the date on which the election petition is presented for trial”. But a successful ending of a case depends on the justice delivery system of a country. The justice delivery system of Bangladesh is not up to the mark. The honorability of justice is not traceable in the verdicts and behaviour of judiciary. Due to lack of socialization, the judges do not have command over the knowledge of differential roles of institutions and individuals. This is the point where politicization intervenes. Judges very often fulfil their political goal or political obligation in their verdicts. On the same account due to lack of sophisticated modality, they often outburst in reckless political terms which minimizes standard of judges and justice ideal. Due to the contradictory relationship between socialization and theoretical knowledge, some judges remain immature to conceive the concepts. This is followed by the anomalous interpretation of the law. They remain away from the essence of what law truly means. This also explains the lack of vision of some of the judges. The legal procedure remains long drawn all thorough. The judges often clash with formal institutions. Relatively poor people cannot afford the long-drawn process of justice. Corruption is another common practice in the judicial process of Bangladesh.

Case 1

Justice delivery system of Bangladesh can be understood from the following case of election disputes. In the case of Noakhali-6 poll results, the High Court rejected the election results of Noakhali-6 and asked the EC to hold re-elections to the seat. The judge delivered the verdict in response to the petition by Ayesha Ferdous, who secured the second-highest number of votes in the 2008 national elections. Independent candidate Md Fazlul Azim was declared elected in the election held on December 28. The High Court rejects the election results as there were irregularities in the 35 poll centres by the

Returning Officer arbitrarily. Md Fazlul Azim challenged a High Court verdict cancelling his parliament membership. The Supreme Court allowed Md Fazlul Azim to put a regular appeal before it against a High Court verdict that cancelled his parliamentary membership. In response to a stay petition filed by Fazlul Azim, the chamber judge of the Appellate Division stayed the operation of High Court verdict and asked him to file a leave to appeal with Supreme Court against the High Court verdict. Being prescribed by the chamber judge of the Appellate Division Fazlul Azim filed a leave to appeal with Supreme Court against the High Court verdict. Though the term of the 9th parliament is close to an end, the case is still pending.

Case 2

Mr Abul Kashem was nominated from Jatiya Party from Tangail-5 constituency and elected as MP in the ninth parliamentary election. Mr Mahmudul, a candidate of BNP defeated to Kashem by the popular vote but decided for a legal fight. He filing suit with the High Court alleged that Kashem was a loan and bill nonpayer. The HC on December 15, 2009, voided Mr Kashem's parliamentary membership by its verdicts and declared his candidature illegal. The court also ordered the EC to proclaim Mr Mahmudul elected, as he got second highest votes in the polls. Mr Kashem Submit a petition with the Appellate Division against the judgment of HC and finally, he lost in the legal battle. The EC determined to execute the verdict of the Supreme Court. The Election Commission declared BNP leader Major General (retd.) Mahmudul Hasan elected as MP from that constituency. This is an incident which was not witnessed in the last 25 years of holding parliamentary elections.

Case 3

The EC scrapped AL leader Mohiuddin Khan Alamgir's candidature in the December 29 parliamentary polls as he was disqualified from contesting the general elections for his conviction in a corruption case. Mohiuddin Khan Alamgir challenged the EC's decision and the HC in November declared the EC's decision illegal. He was elected from the Chandpur-1 constituency. In respect of different verdict, *The Daily Star* comments "why is the judiciary giving different verdicts for similar offences? Major Jashim of Bhola, Mohiuddin Khan Alamgir of Chandpur and Abul Kashem of Tangail were all disqualified on the date of submission of their nomination papers but the courts decided by-election in Bhola instead of declaring the second candidate elected as they have done in the case of Abul Kashem. And when the EC removed Mohiuddin Khan Alamgir the court declared the Election Commission move illegal.

3. Conclusion

Holding credible elections in Bangladesh is always a big trauma. A credible election largely determined by the smooth conduct of elections. It also determines the legal and institutional arrangements. The country's legal institutions are incompetent for holding a free and fair election, as they do not have enough strength to sustain their independence and credibility. Without institutionalization of political procedures, loosely organized Election Commission can't sustain its independence and credibility. In the absence of credibility of EC, the agency of people institutions and their social and political capital

can keep a significant role in the way of holding a credible election, and side by side they also can influence the election outcomes. In this context, an example of the Netherlands and Sweden are cited whose social and political capital of the agency of people institutions is a *welfare system* in the world. In Bangladesh, the social and political capital of the agency of people institutions is far behind the *welfare system*. (Rahaman, Hasibur, 2014:114).

References

- Ahmed, Muzaffer. (2008). "Statutory Framework and Institutional Arrangements". In Mendis, Dushyantha (ed.) *Electoral Process and Governance in South Asia*. India: SAGE Publications Pvt. Ltd.
- Ahmed, Tanvir. (2005). Parliament Watch 2005 - Survey Report. *Transparency International Bangladesh*. Dhaka: TIB. Pp.44-46.
- Akram, Shazada M and Das, Shadhan Kumer. (2006). *A report on the Bangladesh Election Commission (BEC)*. Dhaka: TIB.
- Alavi, Hamza. (1972). *The State in Post-Colonial Societies-Pakistan and Bangladesh*. *New left Review*. No. 74.
- Ali, Raisa. (1996). *Representative Democracy and Concept of Free and Fair Elections*. New Delhi: Deep and Deep Publications.
- Ali, Rehana. (2001). *The Working of Election Commission of India*. New Delhi: Jnanada Prakashan.
- ANFREL. (2008). *Final Report of the International Election Observation Report, Bangladesh*. Dhaka: Asian Network for Free Elections (ANFREL).
- Bailey, Katherine M. (1998). NGOs Take to Politics: The Role of Non-governmental Organizations in Mexico's Democratization Effort. *The Latin American Studies Association*. Chicago Illinois.
- Baral, Lok Raj and Rose, Leo E. (1998). Democratization and the Crisis of Governance in Nepal. In Mitra, Subrata K. and Rothermund, Dietmar (Eds.). *Legitimacy and Conflict in South Asia*. New Delhi: Manohar Publishers.
- Bertelsmann, Stiftung. (2010). *Bangladesh Country Report*. Gütersloh: Bertelsmann Stiftung.
- Choudhury, G.W. (1963). *Democracy in Pakistan*. Canada: Vancouver Publication Centre Ltd.
- Chowdhury, A.N. (1990). *Let Grassroots Speak: People's Participation, Self-Help Groups and NGOs in Bangladesh*. Dhaka: Dhaka University Press. p.25.
- Chowdhury, G.W. (1988). Forward. In Hossain, Golam. *General Ziaur Rahman and the BNP: Political Transformation of a Military Regime*. Dhaka: UPL.
- Dundas, Carl. (2006). "Improving the Organization of Elections: A 2006 Perspective". *The Integrationist*. Jamaica: UWI/CARICOM.
- Eicher, Peter, Alam, Zahurul & Eckstein, Jeremy (2010). *Elections in Bangladesh (2006-2009), Transforming Failure into Success*. Bangladesh: UNDP.
- European Commission (2005). Social values, Science and Technology. *Special Euro Barometer*, https://ec.europa.eu/commfrontoffice/publicopinion/archives/ebs/ebs_225_report_en.pdf
- Forum-Asia Secretariat. (2009). Asian Forum for Human Rights and Development, Bangkok: Forum-Asia Secretariat.
- Gilley, Bruce. (2008). *Civil Society, Democracy, and Elections*, *eJournal USA*. The USA. Available from <http://www.web.pdx.edu/~gilleyb/CivilSocietyDemocracyElections.pdf>

- GoB. People Order (Amendment) Act, 2009. Section 90B (1) b (ii).
- Graber, Doris A. (2001). *Mass Media and American Politics*, United States of America (USA): CQ Press.
- Haque, M. Shamsul. (2002). The Changing Balance of Power between the Government and NGOs in Bangladesh. *International Political Science Review*. 23(4).
- Hasanuzzaman, Al Masud. (1988). Overdeveloped Bureaucracy and Political Development in Bangladesh. In Hasanuzzaman, Al Masud (Ed.). *Bangladesh: Crisis of Political Development*. Dhaka: Department of Government and Politics, Jahangirnagar University.
- Hasanuzzaman, Al Masud. (2009). Political Party and Governance in Bangladesh. In Mushrafi, Mokhdum-E-Mulk and Rahaman, Hasibur (Eds.). *Bangladesh: Politics and Governance*. Dhaka: Mowla Brothers.
- Hossain, Golam (1988). Political Parties and Political Development in a New State: Bangladesh. In Hasanuzzaman, Al Masud (Ed.). *Bangladesh: Crisis of Political Development*. Dhaka: Department of Government and Politics, Jahangirnagar University.
- Huda, ATM Shamsul. (2008). *Role of Civil Society in strengthening Electoral Democracy*. Dhaka.
- Karim, Rezaul. (2004). Politics and Security of Bangladesh, Party Nomination on Sale? *The Daily Star*, 13th Anniversary Special Issue.
- Khan, Shamsul Islam, Islam, S. Aminul and Haque, M. Imdadul (2008). *Political Culture, Political Parties and the Democratic Transition in Bangladesh*. Dhaka: The University Press Limited (UPL).
- Khan, Zillur R. (1997). Bangladesh Experiments with Parliamentary Democracy. *Asian Survey*. 37(6), p. 575-589.
- Kochanek, S. A. (2000). Governance, Patronage Politics, and Democratic Transition in Bangladesh. *Asian Survey*. 34(11), 530-550.
- Kochanek, S. A. (1996). "The Rise of Interest Politics in Bangladesh". *Asian Survey*. 36(7), 230-247.
- Lintner, Bertil. (2002). Religious Extremism and Nationalism-in Bangladesh. *The Bangladesh Observer*. September 3.
- Mahiuddin, K.M. (2009). *The Parliamentary Committee System in Bangladesh. An Analysis of its Functioning*. Germany: VDM.
- Mahiuddin, K.M. (2010). Candidate Selection Process in the Ninth Parliamentary Elections in Bangladesh. In Hasanuzzaman, Al Masud and Alam, Shamsul (Eds.). *Political Management in Bangladesh*. Dhaka: AH Development Publishing House.
- Maniruzzaman, Talukder. (1994). *Politics and Security of Bangladesh*. Dhaka: University Press Limited.
- Masoom, Abdul Lotif. (1996). A Note on the Armed forces in Bangladesh. *Asian Studies*. Vol. 15. Dhaka.
- Mendis, Dushyantha. (ed.) (2008). *Electoral Process and Governance in South Asia*. India: SAGE Publications Pvt. Ltd.
- Miller, Aurthur H. & Wlezien, Christopher. (1993). The Social Group Dynamics of Partisan Evaluations. *Electoral Studies* [online]. 12(1), 5-22. At [https://doi.org/10.1016/0261-3794\(93\)90003-3](https://doi.org/10.1016/0261-3794(93)90003-3).
- Neumann, Sigmund. (ed.) (1996). *Modern Political Parties*. Chicago: The Chicago University Press.
- Prakash, Amit. (2008). Group Discrimination at Elections. In Mendis, Dushyantha (ed.), *Electoral Process and Governance in South Asia*. India: SAGE Publication.

- Putnam, Robert D. (2001). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.
- Putnam, Robert D., Leonardi, Robert & Nanetti, Raffaella Y. (1993), *Making Democracy Work*. Princeton: Princeton University Press.
- Rahman, A.T. Rafiqur. (2008). *Bangladesh Election 2008 and Beyond, Reforming Institutions and Political Culture for a Sustainable Democracy*. Dhaka: The University Press Limited (UPL).
- Rahaman, Hasibur. (2014). *Electoral Management in Bangladesh*. Dhaka: AH Development Publishing House.
- Reuters Foundation. (2010). *The Media and the Election Process*. London: Reuters Foundation.
- Sayeed, Khalid Bin. (1967). *The Political System of Pakistan*. Dhaka: Oxford University Press. Quoted in Mannan, Md. Abdul (2005). *Elections and Democracy in Bangladesh*. Dhaka: Academic Press and Publishers Library. p. 226.
- Steinberg, Gerald M. (2003). Monitoring the Political Role of NGOs. *Jerusalem Centre for Public affairs*. No. 499.
- Suri, K.C. & others (2007). *Political Parties in South-Asia: The Challenge of Change*. South Asian Regional Report. Stockholm: IDEA.
- The National Election Commission of Sudan. (2014). *The Role of Election Observer*. Sudan. Available from <http://unmis.unmissions.org>.

Using Social Media in Teaching and Learning in Government Colleges in Bangladesh: A Study on Cumilla Government Victoria College

Md. Raju Ahmed*
Muhammad Kamruzzaman**

Abstract: The use of Social Media in the field of education is a new phenomenon in teaching and learning practices. It allows both teachers and students to open up a new horizon in education. Social (Facebook, YouTube, and blogs) media enables educators to share ideas, views, and educational contents with learners. In this study, it was tried to explore the effective ways of current practices of Social Media in both the context of developed and developing countries in order to rationalize a positive change regarding the quality of education especially in the government colleges of Bangladesh. Many educational institutions across the globe have applied these tools and made positive changes in teaching and learning. However, there are also many obstacles and challenges to implement these tools in education. According to the study findings, Cumilla Government Victoria College opens up a new opportunity for adopting student centric teaching and learning approach and give a scope for close contact among students-teachers by using social media. There is no official Facebook page of Cumilla Government Victoria College, but there are 3/4facebook pages exist in the name of the college which is run by the outsiders or students of the college. By overcoming the shortcomings can ensure proper use of Social Media in higher education in teaching and learning.

Keywords: Social Media, Teaching, Learning, Education, ICT, Web2tools.

1. Introduction

Social Media tools have become omnipresent and use continues to grow rapidly too. The users of social media each month in 2018 is 3.196 billion, the growth is 13 percent every around the world. For accessing their preferred social media platforms most of the users (9 in 10) use mobile devices (Global Digital Report 2018). Social media denotes to websites and applications that are designed to permit people to share content rapidly, proficiently, and in real-time. They are Internet based sites, facilities, activities, and practice and they maintain relationship, community building, sharing, and involvement (Junco, Heiberger, & Loken, 2010). In their study Bryer and Zavatarro (2011) defined as “Social media are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders” (p. 327). These modern tools consist of networking platforms, wikis, blogs, virtual worlds, and media sharing tools (Bryer & Zavatarro, 2011). Among them most popular tools are Facebook, YouTube, Wiki, LinkedIn, and twitter. Younger generation, teenagers and middle aged people (18 to 34 ages) are major percentage of the total social media user population. In April 2018, Facebook is placed as the most popular social media across the globe by number of active accounts. Facebook was the first social network that exceeds 1 billion registered accounts

* Associate Professor, Department of Political Science, Cumilla Victoria Government College, Cumilla, Bangladesh, E-mail: mrjubd@gmail.com

** Assistant Professor, Department of Government and Politics, Jahangirnagar University, Savar, Dhaka-1342, E-mail: k.zaman@juniv.edu

and presently the monthly active users is 2.2 billion (Statista, 2018). YouTube is second (1.5 billion) with Facebook-owned, WhatsApp (1.5 billion) and Messenger (1.3 billion) is not far behind (Statista, 2018). Social media is by nature non-centralized, meaning that in both form and content, it is user fashioned, user controlled, democratic, very transparent, and not rigid (Moran et al., 2011). The advancement of modern technologies tries its best to put up the demands from people, particularly the younger section of people (Liu, 2010). The huge engagement of young in and potentiality of the social media need to utilize in the field of education. That's why educators of the globe very much keen to connect and stimulate students using social media tools as a workable addition to the conventional teaching-learning atmosphere (Ebner, Lienhardt, Rohs, & Meyer, 2010).

The fast growth of Social Media has rapidly changed the way of traditional teaching and learning practices. This web based mechanism opens up a new horizon of sharing and creating a socially enriched instruction and learning activities. The use of social media in learning gives learners opportunities to get more information, to attach with peer groups and other educational systems that enable education more expedient. It gives educators ample opportunities to advance learning methods and to communicate and assess more students easily. For educational institution, it helps make enhanced student training strategies and shapes student culture.

Higher education in Bangladesh is facing multidimensional quality problems. The government of Bangladesh must identify the challenges in the area of higher education and should take some policy measures to upgrade the quality of education. The policies should include ICT integration in teaching and learning.

Political Sciences is one of the leading subjects studying at tertiary level. The practice of Social Media tools can be useful in teaching-learning process of Political Science in the higher education. On the whole it can dramatically change the teaching-learning environment in the tertiary level education of Bangladesh.

1.1 Social Media: Conceptual Clarity

Social media is any digital tool that allows users to quickly create and share content with the public. Social media encompasses a wide range of websites and apps. Some, like Twitter, specialize in sharing links and short written messages. Others, like Instagram and TikTok, are built to optimize the sharing of photos and videos.

Social Media is a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content (Kaplan & Haenlein 2010: 61) .

Social media is the term often used to refer to new forms of media that involve interactive participation. Often the development of media is divided into two different ages, the broadcast age and the interactive age. In the broadcast age, media were almost exclusively centralized where one entity—such as a radio or television station, newspaper company, or a movie production studio—distributed messages to many people. Feedback to media outlets was often indirect, delayed, and impersonal. Mediated communication between individuals typically happened on a much smaller level, usually via personal letters, telephone calls, or sometimes on a slightly larger scale through means such as photocopied family newsletters (Manning, J. (2014).

1.2 Rationale of the Study

In 2016, the number of enrolled students was 3,150,409 at various universities and affiliated colleges of Bangladesh. The mainstream public enrolled only 260,084. The enrolled students of National University, Islamic Arabic University, the Open University and the private universities were respectively 2.3 million, 240,000, 256,000 and 337,000 in 2016. It is clear that the quality of colleges under the National University of Bangladesh determines the excellence of the greater part of educated human resources in the country. This huge part of the tertiary education system is mainly weak in producing quality graduates (Ahmed Manzoor, April 12, 2018). It is a burning issue for Bangladesh to employ its full effort in developing the quality of higher education. It faces many challenges in the higher education. They are low of standard of education, absence of a strong quality assurance mechanisms and using ICT tools in teaching and learning. In this situation, institutional and policy reform may be effective. Responding to the challenges of globalization using ICT technology can be effective tools for improving quality of teaching and learning process. Social Media tools are able to create student-centric collaborative and innovative learning environment. That's why, it is essential to study comprehensively about the appropriate uses of Social Media in academic arena to ascertain a learners centric excellence teaching and learning atmosphere in the colleges level education of Bangladesh.

1.3 Research Questions

Social Media as teaching and learning tools are applied efficiently in higher education both at home and abroad and able to develop the quality of education. The use of new technology is always a debated issue. It is essential to be acquainted with facts about the efficient uses and their affirmative and adverse aspects of applying Social Media tools in tertiary level education in Bangladesh. So, in this study, it is tried to explore the answers of the following questions:

- a. What were the present practices of Social Media in government colleges of Bangladesh?
- b. How were social media applications currently being used in higher education settings?
- c. What are the barriers and challenges of applying Social Media tools in teaching and learning of Social Sciences discipline in the Government colleges of Bangladesh?

1.4 Research Objectives

The study aim was to identify the useful ways of using Social Media in teaching and learning of Political Science and their probable obstacles and challenges. At last, the authors have made particular feasible suggestions to make certain the successful use of Social Media and promote the excellence of tertiary education in Bangladesh.

1.5 Literature Review

It is an essential part of a research work to review the related literatures. Many studies highlighted on the different aspects of the incorporation of social media tools in tertiary level of education have been made before.

A research (Rosmala, 2012) that discussed on the usage of four types of web based tools such as Facebook, instant messaging, micro blogging, and blogging shows that use of social networking sites during office hours is not only for entertain but also for information sharing and communication. It is more useful for teaching and learning activity. The uses of these web based tools vary from task assignment, notice, class rescheduling, examination, and so on.

Liburd and Christensen (2013) supported social media as a new insightful method for teaching and learning in their study on social media and education. It is put forward the chance to ensure teaching further realistic and practical.

Voorn and Kommers (2013) found that social media is helpful for introvert students. It enables them to increase their collaboration in learning and self-confidence. These types of students prefer to correspond via social media rather than face-to-face communication. Moreover, all students in this study demonstrated their positive attitude for more usages of social media by their educators. In this study it is recommended for higher educational institutions to make more use of social media to enhance collaborative learning environment.

Facebook, the most used social media, has not been extensively used in higher education (McCarthy, 2010). Ractham & Firpo (2011) conducted a study on the using social networking technology to boost learning in tertiary education in a university in Thailand. They observed an optimistic development was attained in learning by using social media, particularly the Facebook. They observed that Social Media Sites, for example Facebook provided users with a familiar and user-friendly technology for students to share and create knowledge. They are very hopeful about social networking technology for being an effective learning tool to foster a culture of collaborative learning environment. They are sanguine about Facebook as a potential tool for the future that make able teaching and learning beyond the classroom.

In a research (Sobaih et al., 2016) on the worldwide usage of social media to meet teaching and learning objectives by teachers and learners, the researchers identified that it links a gap in knowledge in connection to its worth. They observed that the social media can be a valuable teaching and learning tools for tertiary education. The research results demonstrated that the educational outcomes such as knowledge, skills and attitude might develop by increasing the practice of using social media tools by shifting from teacher-centered to learner-centered education.

A study (Shih, 2011) on the outcome of incorporating Facebook and learner assessment of college English writing class teaching through a mixed teaching method was found interesting and effective. The findings also suggest that besides the classroom teaching learners can develop their English writing abilities and knowledge from collaborative learning by using social media. They found that Facebook incorporated education can considerably improve learners' curiosity and motivation.

Zaidieh (2012) mentioned that the usage of social media tools in the field of education is beneficial for both learners and instructors. Students can be benefited by learning through informal communication. Moreover, they can collaborate, feedback being independence of space and time. It makes able teachers to gain response from students and regular contact with students.

Lederer (2012) sketches a number of usefulness of social media as teaching tools in teaching and learning activities. First, she mentions that social media is a useful means to boost learners' involvement and contact abilities and it provides learners at ease for stating themselves in less frightening surroundings. Secondly, social media can develop contact between teachers and students. Teachers are able to response students' queries, send messages, post assignments and lecture plans, notify important information, timetable or declaration forthcoming events, and share any virtual content. Lastly, students can use social media sites for searching job by creating a skilled Web presence, posting a bio-data, and examining probable employers.

Moran, Seaman, and Tinti-kane (2011) stated that Facebook is not only the most visited site but also the highest posted site by teaching faculty. The researchers observed that YouTube is the second most visited, but posting rates are low. They also observed that for professional purposes faculties like LinkedIn; and Wikis and Blogs are used for instruction and learning.

Al-Rahmi et al. (2015) observed that numerous tertiary educational institutions are practicing the traditional teaching and learning approaches. Traditional educational methods hamper in creating student centric modern educational atmosphere. The study (Al-Rahmi et al., 2015) results exhibited that there is a noteworthy relation between the students' academic performance and collaborative learning by using social media. They identified that without shared learning, no educational institution can take benefit of social media for the advancement of academic achievement.

In his study Liu (2010) stated that the most visited social media are Facebook, YouTube, and Wikipedia. The study results also show that the causes for using these tools are social interaction, communication, relation building and swiftness of feedback.

The study on micro-blogging services, Gao et al. (2012), pointed out how micro-blogging has an importance to support sharing, insightful thinking, engagement, mutual learning, and to develop learning content in diverse formal and informal learning environment.

In their critical study on Facebook as a technology-enriched learning environment, similar possibilities as stated earlier were also focused by Manca and Ranieri (2013). The authors focused a number of Facebook's academic matters, such as the probability of mixing diverse information and learning resources, to hybridize different knowledge and understanding, and to broaden the perspective of learning. However, the researchers also anxious about some obstacles that may stop a complete acceptance of Facebook in an educational institution, such as open and implied official policies, knowledge of teachers and students, and a number of cultural matters.

Social media sites make us able for fast accessing to information, as well as allow us instants collaboration between peers and can play a considerably role in instruction and learning process, but the blessings are not unmixed. However, many writers have much anxiety in the usage of social media in academic purposes. They are mostly concerns using these tools as educational tools (Moran et al., 2011; Davis et al., 2012; Au, Lam, & Chan, 2015). Kirschner and Karpinski (2010), in their article, concluded that the usage of Facebook negatively effects on GPA and learning time spent by the students per week.

However, Gao et al. (2012) identified a number of challenges in integrating such tools in

educational setting, for example, not acquaintance with the social media tools, distraction of information, information burden, and inability to focus and express oneself clearly.

In their study, Manca and Ranieri (2015) stated that social network sites have several challenges and opportunities in using teaching and learning process. The important issues are: 1. communication between learners and teachers and their proper professional behaviours; 2. academic and technological challenges that is linked with integrating social media practices in teaching and learning practices; and 3. teachers' professional training and development in using social media. The authors also observed several implications for practices and policy. In a study on the usage of social media tools, Rodríguez-Hoyos et al. (2015) suggested that it is necessary to research on the issues such as gender and geographical variances that could shake attitudes, confrontation and real uses of these web sites.

In their study Sobaih et al (2016) identified eleven main concerns or obstacles of the using social media in tertiary level education. These anxieties and obstacles for the usage of social media for educational field are connected to each other. Several of these anxieties are linked with teachers, while others are connected to students. Some concerns are liked with educational institutions and management. The study results also show that the privacy and security; Loss of Control and Monitoring; Time Commitment, and Digital divide are the prime anxiety for the usage of social media tools in teaching and learning.

Moran et al. (2011) examines the association between the different types of use, the link between frequency of usage of Social Media tools in blended teaching, in addition to the use of institutional preparation for e-learning systems. They found lack of honesty of student among the prime concern by teaching staffs for using of social media in class. The other barriers are privacy and integrity; lack of training, Lack of institutional support and take too much time.

A study (Manca and Ranieri, 2016) on social media confirms that Social Media use is still insufficient and controlled. The embracing of Social Media is dependent on the faculty's discipline, age, prior experience and seniority. Overall, the study highlights more encouraging attitude towards individual sharing and linking with peers rather than incorporating these tools into their teaching learning environment.

1.6 Methodology

Research methodology is a way to solve the research problem systematically. Research methodology may be understood as a science of studying how research is done scientifically (Kotheri, 2004). In this study, the research is conducted based on both the primary and secondary data. The sources of primary data were personal observations, three Focus Group Discussion (FGD) were conducted where 6 teachers and 24 students of the department of Political Science, Cumilla Victoria Government College, Bangladesh had attended and shared their opinion based on structured questions. This technique was used to crosscheck the collected data and information. Two sessions were conducted. Duration of each session is one and half hours. A list of topic related to using the using social media in teaching and learning process was used as a guideline of the FGD. The secondary data were collected from books, articles, journals, newspapers, web

based data and other research papers written on social media tools. The present research is basically qualitative in nature. Some quantitative data are also collected and used to substantiate the qualitative data.

Structurally, the paper has five sections with subsections included. In the Section One, the research problems, Conceptual discussion on Social Media, Rationale of the Study, Research questions, Literatures Review and Methodology are discussed. Section Two discusses Present Practices of Social Media in Bangladesh, Section Three deals with the critical and reflective discussion on using of Social Media and its obstacles and challenges, Section Four discusses some recommendations in favor of using Social Media and finally, Section Five draws the conclusion and way forward.

2. Present Practices

Bangladesh has kicked off incorporating Information and Communication Technology (ICT) in teaching and learning to established student centered and technology based classroom to face the challenges of the global village. In many higher education institutions, ICT based educational tools are being used in teaching and learning process along with traditional tools. The attitude of the learners were found encouraging to the usage of Social Media specially in Facebook, YouTube, Wiki and blogs (I. Jahan & Ahmed, 2012). In this section, the present practices of Social Media in government colleges of Bangladesh will be described.

2.1 Present Practices of Social Media in Bangladesh

According to state counter, the most used Social Media is Facebook (88.12% social media user) in Bangladesh. As per, Bangladesh Telecommunication Regulatory Commission (BTRC) there are 29 million registered Facebook users in Bangladesh. The Facebook users use 88 Gb of the country's total available bandwidth of 436Gb. As of June 2017, there were 73 million internet users in Bangladesh. Facebook is the most popular social media among the students of Bangladesh. According to Mouri & Arshad (2016), 73% of the Facebook users in Bangladesh have between 13 and 25 years. It indicates that most of them are students either at secondary school or at university. Mouri & Arshad (2016) observed that millions of students of Bangladesh use Facebook regularly to interact with friends, teachers, and senior students of the institution, but a very small portion of that interaction are devoted to academic purposes. The students use SNSs mainly for sharing news and views, entertainment, and class notes or schedule of class or exam time. Many educational institutions have their official social media page particularly Facebook page.

YouTube is the second most using social network site (8.3% social media user) in Bangladesh. YouTube can be treated as treasure trove for educational content. YouTube make possible to go beyond the lecture based delivery method to make student centric learning platform with using free video-on-demand for a variety of educational uses. Wikipedia is the most commonly known wiki website is used by the educators of Bangladesh to make more informative class lecture.

2.2 Existing Practices of Social Media in College teaching and learning

Cumilla Government Victoria College is one of the most important and oldest educational institutions of Bangladesh. It was established in 1899 A.D. At present, the college has 22,000 students and 165 teachers. The college is trying to adopt ICT related tools as a part of educational technological development. It has a website. The college website integrated with online platforms that promote to create a collaborative educational environment. The website is used to make collaboration with students, teachers and guardians and other stakeholders. It provides college related up to date information and notices. The results of the internal examination is published on the site. Most of the classrooms of the college are equipped with multimedia facilities. Almost all teachers have their personal computers.

Every department is under the coverage of Wi-Fi network. This facility is available only for teachers of the college. In the college there is an in-house training center named 'Cumilla Victoria Govt. College Center of Excellence' for teachers. The Center of Excellence authority arranges training program to increase teachers' efficiency in using ICT related technology for teaching and learning. These training make a teacher to be able in using web 2.0 tools particularly social media in education.

The above mentioned initiatives make possible to ensure an enabling environment for creating ICT technology based modern teaching learning process. It opens up a new opportunity for adopting student centric teaching and learning approach and give a scope for close contact among students-teachers by using social media.

There is no official Facebook page of Cumilla Government Victoria College, but there are 3/4facebook pages exist in the name of the college which is run by the outsiders or students of the college. But there are two Facebook page run by teachers. These secret/close group pages are only for the teaching faculty. Teachers of the college can share their views using these pages. Administrators of the groups post various notice and academic information through these groups. There are eight students' organizations in this college to run the co-curricular activities. Every organization has their Facebook group. These groups are mostly open. These groups share the activities related photo, notice and information by their pages.

There are 22 departments under four Faculties in Cumilla Victoria Government College. All 22 departments of this college have their Facebook page. These Facebook pages are not official page of the department. All pages are administered by the students of the respective department. Most of the department have even students' session wise Facebook page. These Facebook pages used to circulate information concerning classes, examination, assignment, and other relevant activities.

2.3 Present Practices of Social Media in Classroom teaching and learning

Cumilla Victoria Government College is one of the very ancient and renowned educational institutions in Bangladesh under National University of Bangladesh. Almost 1200 students are studying at the under-graduate and post-graduate level in the department. Now only twelve teachers are working as faculty members in the Political science department. The teachers are very much eager to make their teaching more effective by using ICT based devices. The usefulness of teaching is generally depends on

presentation of the topic by teacher and vigorous participation of students. Sharing ideas and opinions beyond the classroom can be more effective for teaching and learning process. For making a participatory student centric teaching most of the teachers are using multimedia in the class room teaching and learning. In Political Science department all classrooms are equipped with multimedia projectors. Multimedia makes classes more attractive and makes students more interactive in learning. It makes enable to access and express vast diversity of data and information. It makes presenting the global politics more stimulatingly.

In the class room teaching and learning a good number of teachers have already started using social media in their teaching activities. Social media can be important tools to make the topic more attractive for presentation and more collaborative learning environment. The students of the classes are very enthusiastic about the using social media. Most of them have their own Facebook profile. They are using their personal profile for sharing news and views mostly personal.

The Victoria Government College has already mentioned that there are 4 Facebook page in the name of Cumilla Victoria Government College. All are close group page. These groups are run by the students. The teachers and students of the department use these pages for communicating purposes. All sorts of notices also posted in the group pages. Examination schedule, assignment groups and schedule, campus activities of students are also published in the group pages. Academic use of the social media is very rare.

3. Critical and Reflective Discussion on using of Social Media and its Obstacles and Challenges

The rapid growth of the uses of Social Media is an undeniable. Social media is a cybernetic meeting space which permits the user to express, exchange ideas and act together in an informal atmosphere. These platforms enable thousands of students to connect and give-and-take ideas. For these reasons social media have a great significance to use in the process of educating and learning. In this section It has critically discussed researcher's experiences in the light of global, national and local practices on the issues associated with the usage of social media in education.

3.1 The Using of Social Media in the colleges of Bangladesh

The trend of the usage of social media tools in academic arena is rapidly increasing. By using social media teachers connect with students and involve them in their courses. Students can check their class task and collect course related notices. Social media is important tools in creating stronger learning communities that enable collaborative learning settings. Students can download lectures posted by their teachers. A teacher can share suitable education related links for learners for checking. By using social media teachers can simplify class discussions and give assignments or projects work and post learners' educational accomplishment or successes. Students also can post their remarks and asks on educational matters. Thus by using social media student centred learning environment makes possible (Sobaih et al., 2016). These are the global academic practices of social media tools in education that the educators of Bangladesh can replicate.

To receive the above mentioned facilities the educational institutions Bangladesh should change their traditional academic settings by including web 2.0 particularly social media as tools of education. Social media are tools that can build and strengthen campus community and inspire learners to share the social event and activities of their campus.

It is apparent that there are ample opportunities in using social media as learning tools. The proper use of these tools will create enabling educational environment with more independence, collaboration, and creative. To face the challenges of the 21 century and need of the young generation, the educators of Bangladesh should come forward in using the educational technology in the field of education. The young generation of Bangladesh has enormous potentiality in the field of online. This is unique way to use web 2.0 particularly social media for the effective results in the field of higher education.

We have already mentioned that practice of using social media in Cumilla Government Victoria College is very limited. Most of the usages are related to informing the students about the academic notices, examination schedule and social activities of the campus.

For academic use of the social media we have recently created a close group for Honours (4th year) students. We think that this group is very much helpful to make a collaborative learning environment. We use the group to communicate with students about learning matters and to disseminate class lecture notes. The students of the class are active in sharing opinions ideas and comments on class lectures. We also post topic related video. The students make comments on the lecture topic or on the video.

To enrich our class lectures, we are using YouTube and Wikipedia. The video content, collected from YouTube, make class more active. We also share the video content through Facebook. Sometimes we ask students to create content for presenting in the class and share the content by using Facebook. We think it facilitate the teaching learning process more pleasant and collaborative.

According to the findings of FGDs, teachers of Cumilla Government Victoria College expressed that they are very interested in using social media. The easy and any time communication and share of study contents are treated as most positive aspects of the using of social media. They have no clear guideline or training for it. So, they suggested for special training on the usage of social media in teaching. It is observed that students are more comfortable in sharing their ideas through social media.

3.2 Obstacles and Challenges in Using Social Media in the Colleges of Bangladesh

Like other country Social Media users of Bangladesh also face many challenges in using social networking in education. One of the prime concerns is the privacy of personal information. Many teachers are afraid of being tracked their personal activities, for this reason they are not interested in sharing their personal profiles with students (Sobaih et al., 2016). This privacy concern is also a challenge for Bangladeshi users. In the studied college, many teachers are not willing to share anything with students by using their personal profile of Facebook or other social media due to afraid of being tracked.

Poor ICT infrastructural facilities are another issue for being concern in using social media in education. High speed internet access in campus is a necessary requirement for using web 2.0 tools in teaching and learning process. In Bangladesh, this requirement is

not satisfactory. In Bangladesh the speed of Internet is not the fastest in perspective of the world but recently the speed has considerably developed. Satisfactory quality and consistency in internet connectivity is mostly relatively expensive in Bangladesh. ICT related devices are not available in my college. Though all the faculty members of the studied college have personal desktop or laptop, most of the college students have no personal computer. Access to internet facilities is not up to mark. Though there is wifi hotspot for internet access in campus, only faculty members can enjoy this facility. The students of college are not entitled using wifi hotspot for accessing internet. This is a great challenge for using these tools in the teaching and learning process in the college.

Digital gap is another limitation. Access to computing resources and the Internet on/off campus is not available for all students. This hampers to create an enable environment for social media supported educational settings (Barczyk C. & Duncan, D. G., 2011). This scenario of Bangladesh is also same. The experiences of the researchers are also similar. Most of the students are living outside of the college campus. These students are not getting any internet facility provided by college authority. Some students have no financial capacity to have computer and afford to bear the expense of the cost of internet. The observation of the study is that digital gap limit the scope of introduction web 2.0 based education system.

Institutional supports are very important for complete introduction of web-based teaching and learning. In the studied college there is no IT support center. Though there are two computer training for the students, many students are unable to afford the training fees. Lack of computer literacy is the prime barrier for introducing social media tools in education pertaining process. The teachers, who are not skill in computer, are not interested in using ICT based teaching and learning. They are the great advocate of traditional method of teaching. Many teachers are worried about the misuse of social media. Most of them are not at all interested using social media as teaching or learning tools because of their prejudice about the tools. Social media are treated as a media for entertainment by them. In their opinion some teachers of the college said that they are worried about the time consumption of the students who are using the social media.

In the FGD, the teachers of the studied college expressed their worried about some aspects of using social media in teaching and learning. It is found that they were very much anxious about the misuse of social media. Some of them said that more using of the social media might a cause of more absenteeism in the classroom. Due to maintaining class wise Facebook page or other social media the burden of the teachers has increased. The regularly maintaining the social media page a teacher will need more time or engagement for posting lecture or other notifications and respond the queries. It is a big challenge for a teacher who is burden with lots class and students.

The above mentioned barriers and challenges should properly address for taking the advantages of social media in education. The higher educational institutes of Bangladesh like Cumilla Victoria Government College are with a number of classes with huge quantity of students. No teacher can able to reach each of the students in the classes. If they use social media in pertaining teaching it can make them able to interact with them even after class time and can make students more informed. The proper use of social media can be a great way to support learners and boost the teaching and learning process more convenient and effective.

4. Study Recommendations

Social Media is quite a new idea in the arena of higher education in Bangladesh. The uses of online Social Media tools create a new horizon in studying almost every discipline including Political Science. There are major threats and many obstacles for their proper use. So, a general institutional ethic policy should be established for the good online coexistence with everybody and mainly with students for the usage of these online based tools in teaching and learning in the colleges of Bangladesh. The policy will be integrated IT related matters most importantly the use of social media.

The educational institute must be equipped with computer related facilities. The campus should have improved internet access with Wi-Fi hotspots where access of students will not be restricted. There should have computer technology related support center in college, so that teachers and students can easily solve any problem related to ICT.

For mitigating the digital gap, ICT related training should have available for teachers and students of the college with nominal charge. It will make teachers and students more skill. For this ultimately the institution will be enriched with an ICT based educational environment.

To share teachers and learners experience in using social media, college should organize seminar, symposium or workshop. If possible, a guideline or manual can be made by institutions. These will be helpful to mitigate the obstacle related to use of social media in educational process.

5. Conclusion and way forward

One of the purposes of this study is to endow with a deeper understanding of using social media in teaching tertiary/higher level education in Bangladesh. We assert that this assignment does achieve that goal. We think, this study makes us clear that the social media is a powerful device in the field of education. By using these tools educators will be able to provide student centric more effective teaching and students will find them in shared and collaborative learning environment. In spite of some limitations, the advent of ICT based educational technology show a new horizon in the field of higher education. These tools make students enable to boost the applied understanding and help in building a dynamic classroom by confirming the lively involvement of all students. There are many challenges are traced in this study. Poor ICT infra-structure, digital gap, lack of training, fear of hampering in privacy, work-overload, engagement too much time, resistance to take new knowledge and cultural constrains are the main barriers and challenges in using these online based tools in education. So, the challenges mentioned in the present study need to address properly for proper utilize of the social media in the field of education.

References

- Ahmed M. (2018, April 12). Salvaging our higher education: *Is our higher education in such a state of desperation?* *Daily Star*, Retrieved from: <https://www.thedailystar.net/opinion/society/salvaging-our-higher-education-1561396>
- Al-rahmi, W. M., Othman, M. S., Yusof, L. M., & Musa, M. A. (2015). Using social media as a tool for improving academic performance through collaborative learning in Malaysian higher education. *Review of European Studies*, 7(3), 265.

- Barczyk, C., & Duncan, D. G. (2011). Social networking media as a tool for teaching business administration courses. *International Journal of Humanities and Social Science*, 1(17), 267-276.
- Bryer, T. A., & Zavattaro, S. M. (2011). Social media and public administration: Theoretical dimensions and introduction to the symposium. *Administrative Theory & Praxis*, 33(3), 325-340.
- Ebner, M., Lienhardt, C., Rohs, M., & Meyer, I. (2010). Microblogs in Higher Education—A chance to facilitate informal and process-oriented learning?. *Computers & Education*, 55(1), 92-100.
- Gao, F., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008–2011. *British Journal of Educational Technology*, 43(5), 783-801.
- Gao, F., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008–2011. *British Journal of Educational Technology*, 43(5), 783-801.
- Hamat, A., Embi, M. A., & Hassan, H. A. (2012). The use of social networking sites among Malaysian university students. *International Education Studies*, 5(3), 56.
- Jahan, I., & Ahmed, S. Z. (2012). Students' perceptions of academic use of social networking sites: a survey of university students in Bangladesh. *Information Development*, 28(3), 235-247.
- Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of computer assisted learning*, 27(2), 119-132.
- Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business horizons*, 53(1), 59-68.
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in human behavior*, 26(6), 1237-1245.
- Lederer, K. (2012). Pros and cons of social media in the classroom. *Campus Technology*, 25(5), 1-2.
- Liburd, J. J., & Christensen, I. M. F. (2013). Using web 2.0 in higher tourism education. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 12(1), 99-108.
- Liu, Y. (2010). Social media tools as a learning resource. *Journal of Educational Technology Development and Exchange (JETDE)*, 3(1), 8.
- Manca, S., & Ranieri, M. (2013). Is it a tool suitable for learning? A critical review of the literature on Facebook as a technology-enhanced learning environment. *Journal of Computer Assisted Learning*, 29(6), 487-504.
- Manca, S., & Ranieri, M. (2016). "Yes for sharing, no for teaching!": Social Media in academic practices. *The Internet and Higher Education*, 29, 63-74.
- Manca, S., & Ranieri, M. (2017). Implications of social network sites for teaching and learning. Where we are and where we want to go. *Education and Information Technologies*, 22(2), 605-622.
- Moran, M., Seaman, J., & Tinti-Kane, H. (2011). Teaching, Learning, and Sharing: How Today's Higher Education Faculty Use Social Media. *Babson Survey Research Group*.
- Mouri, D., & Arshad, C. A. (2016). Social networking in Bangladesh: Boon or curse for academic engagement?. *Management & Marketing*, 11(1), 380-393.
- Porto, C., Santos, E., & Chagas, A. (2016). FACEBOOK AND EDUCATION post, like & share. *Elizete Lúcia Moreira Matos and Jacques de Lima Ferreira, The use of Facebook social network in the process of teaching and learning in college*, P. 366.

- Ractham, P., & Firpo, D. (1899, December). Using social networking technology to enhance learning in higher education: A case study using Facebook. In *hicss* (pp. 1-10). IEEE.
- Rodríguez Hoyos, C., Haya Salmón, I., & Fernández Díaz, E. M. (2015). Research on SNS and education: The state of the art and its challenges.
- Rosmala, D. (2012). Study of social networking usage in higher education environment. *Procedia-Social and Behavioral Sciences*, 67, 156-166.
- Shih, R. C. (2011). Can Web 2.0 technology assist college students in learning English writing? Integrating Facebook and peer assessment with blended learning. *Australasian Journal of Educational Technology*, 27(5).
- Sobaih, A. E. E., Moustafa, M. A., Ghandforoush, P., & Khan, M. (2016). To use or not to use? Social media in higher education in developing countries. *Computers in Human Behavior*, 58, 296-305.
- Sobaih, A.E.E., Mohamed A. Moustafa, M.A., Ghandforoush, P., & Khan, M. To use or not to use? Social media in higher education in developing countries. *Computers in Human Behavior* 58 (2016) 296e305.
- Voorn, R. J., & Kommers, P. A. (2013). Social media and higher education: introversion and collaborative learning from the student's perspective. *International journal of social media and interactive learning environments*, 1(1), 59-73.
- Zaidieh, A. J. Y. (2012). The use of social networking in education: Challenges and opportunities. *World of Computer Science and Information Technology Journal (WCSIT)*, 2(1), 18-21.
- <http://gs.statcounter.com/social-media-stats/all/bangladesh>
- <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>
- <https://www.dhakatribune.com/feature/tech/2017/09/06/2-active-facebook-users-bangladesh/>
- <https://wearesocial.com/blog/2018/01/global-digital-report-2018>

Price for Quality in Vertically Differentiated Smartphone Markets

S. M. Ikhtiar Alam*
Mohammad Nazmul Islam**

Abstract: Product market vertically differentiated by quality involves groups of large number of related commodities that differ in qualities, which are a type of commodity attribute. Product qualities are special in the sense that all consumers want more of them. All consumers agree that more quality is better (or less of quality is better, as with weight of a cellphone). Consumers do not have ideal levels of qualities as they do have in horizontally differentiated attributes. Some goods involve both types of attributes. Smartphones should always have higher power (RAM), better camera, or more internal memory. But some consumers prefer Samsung smartphones, and others prefer comparable Oppo. The distinctly different tastes of different consumers who consume goods allows such diversity to be perpetuated. This result generalizes in more than single quality dimensions. Each new dimension doubles the number of types of smartphones that could readily survive in unrestrained competition. In two dimensions we would expect two distinct smartphones in the market, one at each corner of the quality space. The present paper proposes a comprehensive model to explain the market behavior vis-à-vis the consumer behavior in a quality-based vertically differentiated product market in reference to smartphones. These markets are monopolistically competitive market in general. In vertically differentiated markets the high valuation consumers are willing to pay high price for high quality smartphone and the low valuation consumers will pay low price for low quality. The proposed model uses perceived customer driven valuation line that is positively related with the perceived weighted average quality index (WAQI). This valuation line is independent of price. In this model, price has been treated as an exogenous factor. To buy or not to buy a particular smart phone, the consumer will compare its valuation with the quoted price. If the quoted price is higher than the valuation, s/he will not buy it. If the quoted price is lower than the valuation, then s/he will buy. This approach of using valuation line to explain the behavior of vertically differentiated product market has not been used in any research or academic work till now. The proposed generalized model equally applies to other consumer durables as well. The paper also includes some hypothetical examples of smartphones to clarify different issues and logics.

Keywords: Price for Quality, Vertical Differentiation, Product Valuation Line. WAQI.

1. Introduction

In Marketing and Economics, we find many products which are treated as homogenous although they are not patently homogenous. For example, in the car market we treat all the cars as homogenous. Cars with different features are not homogenous as such. They are of course close substitute for one another, but for some purpose we cannot count them up as if they were homogenous units of a single product. In differentiated market some products are horizontally differentiated while some vertically. “In businesses with diverse product lines, differentiation is one of the main keys to success. With differentiation, you can sell products with different purposes to customers with different needs. Products may be differentiated according to quality, functionality or

* Professor, Institute of Business Administration, Jahangirnagar University, Savar, Dhaka.
E-mail: smikhtiaralam@yahoo.com

** Associate Professor, Institute of Business Administration, Jahangirnagar University, Savar, Dhaka.
E-mail: bulbul_juniv.edu

design. In general, differentiation based on higher and lower quality is vertical, whereas differentiation based on different functions or features, aesthetics, packaging, or brands is horizontal” (Button, 2017). The balance between price and quality and the psychological decision making behind it has always been a challenge for marketers. This is because one of the factors in the marketing mix which always troubles marketers is pricing the products in terms of quality (Bhasin, 2020). Bhasin also added that as years and years of research have shown, pricing is a strong psychological component which can manipulate customer’s decision making. Keep the pricing high, and the customer will think that the quality must be high too. This expectation of the customer is because s/he wants to receive value for money. So, when s/he is paying more money, s/he is expecting more value.

On the other hand, if a product is of high quality, and the seller is keeping the price low, the customer might not see the value in the product. S/he might think that s/he is paying so less for the product. Then, is the product up to mark? Will the quality be high when the price is so low? That is the problem with a price-quality relationship. Thus, it is not correct to assume that the channel between quality and price of smart phone is unidimensional.

It is found that markets for a large number of products—smartphones, emergency lights, audio equipment, camera, to name a few—differ fundamentally from horizontally differentiated product. In the quality-based vertically differentiated markets products differ in their specifications, which can be termed as product qualities. With respect to a quality, all prudent consumers will prefer more of that particular quality. For example, a faster smartphone will prefer more memory is better than a slower smartphone or one with less memory. Markets for quality based differentiated products are more likely to be driven by technological competition. Thus, the type of competition in these markets affects the resource allocation of the firms in the industry and their choice of how to enter in the product space.

Jean Tirole (1988) developed a model on vertical differentiation in monopolistic market based on the earlier works of Gabszewcz and Thisse (1979, 1980) and Shaked and Sutton (1982, 1983). He first analyzed the oligopolistic competition under quality differentiation. He analyzed the competition between two firms given the utility function as:

$U = \theta_s - p$ if the consumer consumes one unit of quality s and pays price p , and by 0 otherwise. The parameter θ of preference for quality is uniformly distributed across the consumers between $\theta' \geq 0$, and $\bar{\theta} = \theta' + 1$ where density is 1. Firm i produces a good of quality s_i where $s_2 > s_1$. The unit cost of production is c . At this point, Tirole assumes that

$$\bar{\theta} \geq 2\theta' \text{ and } c + \frac{\bar{\theta} - 2\theta'}{3}(s_2 - s_1) \leq \theta's_1,$$

which ensures that in the price equilibrium the market is covered. On the basis of quality differential and differential in monetary values, he developed the Nash equilibrium for

both the firms and concluded that “the high quality firm charges a higher price than the low-quality producer. It also makes a higher profit.” Gapszewicz, Shaked, Sutton, and Thisse (1981) wrote a comprehensive article on the Nash equilibrium of price competition among differentiated product. They concluded that Low-quality product must have low price and high-quality product will be sold at higher price.

Bonanno (1986) and Gal-Or (1983) consider vertical product differentiation under quantity competition rather than price competition and report that, in general, Cournot competition does not lead to less product differentiation than price competition.

Nicholas (1951) perhaps the first researcher to conclude that in USA, the equilibrium price and output of cigarette market are determined on the basis of quality competition, rather than price competition. He added that “consumers with preference for Low quality buy cheap cigarettes, given the budget and Consumers with tastes for high-quality cigarettes buy expensive brands at a high price”. However, he said, budget was not always a determining factor in case of cigarette smokers.

Deltas, Stengos, and Zacharias (2010) proposed a mathematical model that empirically examines the joint pricing decision of products in a firm’s product line. When products are distinguished by a vertical characteristic, those products with higher values of that characteristic will command higher prices.

Dennis Z. Yu (2012) proposed an integrated modeling framework to study a monopolist firm's decisions of product variety and related production batch planning for quality-based vertically differentiated products. Customers are heterogeneous in their marginal valuations of the product quality level and make their purchase decisions to maximize a utility function of price and quality.

Raphael and Auer (2017) developed a model on the dynamic entry in vertically differentiated markets. They proposed that vertical innovation in which firms incur a market entry cost and choose a unique level of quality. Once established, firms compete for market shares, selling to consumers with heterogeneous tastes for quality.

The present paper proposes a comprehensive model to explain the market behavior vis-à-vis the consumer behavior in a quality-based vertically differentiated product market in reference to smartphones. These markets are monopolistically competitive market in general. In vertically differentiated markets the high valuation consumers are willing to pay high price for high quality smartphone and the low valuation consumers will pay low price for low quality. The proposed model uses perceived customer driven valuation line that is positively related with the perceived weighted average quality index (WAQI). This valuation line is independent of price. In this model, price has been treated as an exogenous factor. To buy or not to buy a particular smart phone, the consumer will compare its valuation with the quoted price. If the quoted price is higher than the valuation, s/he will not buy it. This approach of using valuation line to explain the behavior of vertically differentiated product market has not been used in any research or academic work till now. If the quoted price is lower than the valuation, then s/he will buy. The proposed generalized model equally applies to other consumer durables as well. The paper also includes some hypothetical examples of smartphones to clarify different issues and logics.

2. Theory: The Basics

Suppose we examine the market for smartphones and measure a smartphone's weighted average quality index (WAQI) in terms of smartphones specifications. Based on these specifications we can easily determine a relative weighted average quality index for each type. Let us term this WAQI is the relative quality of each specification. We should remember at this stage that a new smartphone with different specification doesn't just only offer a different color or style, it generally offers something of higher quality. Let us denote the WAQI by R . We are not interested to construct WAQI for various types of personal smartphones in this paper. In this study we treat WAQI as a composite quality measure for smartphones. However, we should understand a faster smartphone has more WAQI and that all smartphone buyers want more WAQI. Now the obvious question is how can we indicate the strength of consumer preferences—whether derived from subjective valuations as for ordinary consumer analysis or derived from the value of output as with derived demand for input factors? Let us assume—for simplicity of the analysis—that demand for smartphone's quality has no complementary or substitute commodity.

In addition, we assume that a given potential consumer is willing to pay a constant incremental price for each incremental unit of quality—that is, the marginal willingness to pay off a given consumer for quality is constant. Thus, the relationship between quality and price for a single consumer is linear and positive. This assumption is made only for simplification of this analysis. This linear relationship between price and quality for a single consumer can be shown by an equation termed valuation function as follows:

$$V = V_0 + cR, \text{ for } V_0 < 0 \text{ and } c > 0, \quad (1)$$

where: V = total valuation of different levels of quality assigned by a particular consumer, V_0 = shift parameter, c = slope of the equation representing constant marginal value (in terms of willingness to pay) a given consumer places on quality, and R = weighted average quality index (WAQI).

The consumer places more value on higher level of quality—as do all consumer—so the valuation function has a positive slope. If no cellphone were available with price-quality combination below the valuation line, the consumer would not buy any cellphone. Figure-1 graphically depicts the Valuation Line. On the other hand, if only one available smartphone were below the line, the consumer would buy the one vertically most below the valuation line, as the vertical distance below the line measures the consumer surplus available from the smartphone as that price, when price is measured on the vertical axis and the quality on the horizontal axis.

3. The Valuation Line

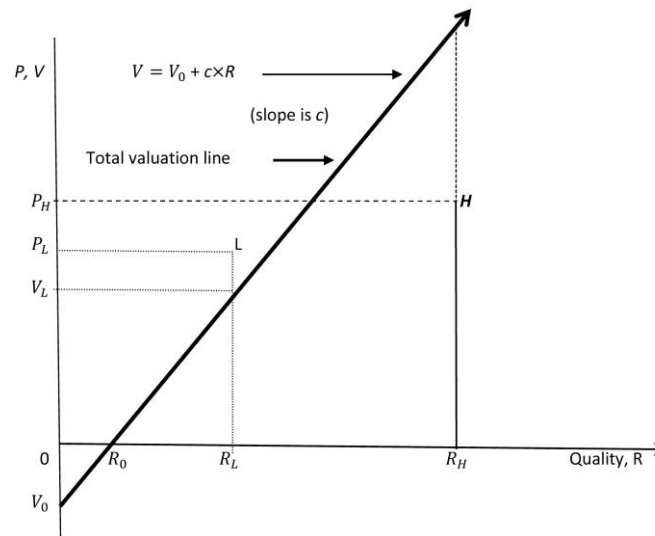


Figure 1: The valuation of a consumer for a smartphone's quality

Purchase of the first would shift the valuation curve downward (that is, V_0 would fall), and the same analysis could be done again. Each time an available smartphone below the valuation curve shifts below all the available smartphones, no more are purchased. The simple version of the model used here assumes that consumers vary only by the slope of their valuation lines, c_i , and not by shifts in the intercepts, V_{0i} .

Explanation of the Valuation Line:

The valuation line is positively related to the quality of a smartphone (in any other normal products this is true). When a consumer decides to purchase or not to purchase a product s/he considers his/her "perceived consumer driven value" or PCDV. If and only if the PCDV is greater than the total cost of buying the product, the customer will buy it; otherwise s/he will not. That is:

$$\text{Perceived CDV} > \text{Expected } \mu \text{ (TP)} - \lambda \text{ (P)} - \phi \text{ (Other User Costs)}. \quad (2)$$

The above equation states that when PCDV is greater than the expected utility from consuming the product minus the cost of using the product is greater than zero, only then the product is worth buying. The valuation line shows this PCDV at different level of quality index (WAQI). Price is exogenous and is compared with the value to make a purchase decision. However, price and WAQI are not, in general unidimensional; with the exception that when a snob customer believes that price gives the right signal of quality. Howbeit, valuation and WAQI are obviously unidimensional. Repeated again, the valuation line is not the loci of various coordinates of price and WAQI, despite price and valuation have been measured on the same axis. In Figure-1, it is clearly depicted.

The total valuation line shows how much a consumer would be willing to pay to get a specific level of quality or WAQI. The vertical intercept V_0 is negative as the consumer would not want to buy a smart phone with zero quality (in fact, a zero quality doesn't

exist in the market). The slope of the valuation line c is assumed to be constant, meaning the consumer would be willing to pay Taka c for each incremental unit of quality. When smartphones are offered with lower quality (denoted by L) and with higher quality (denoted by H) as has been shown on the above graph. In this case, L is above the consumer's total valuation line. But, the consumer would not buy L at P_L . Because P_L is more than the value V_L , to this consumer. The consumer would be willing to buy a high-quality, such as H in our graph, as it is below the total valuation line and provides net benefits measured by the vertical distance between price-quality point H and the total valuation line.

According to this proposed model, since all consumers have a constant trade-off between quality and price, their demand for the next are distinguished only by the slope and the intercept of the valuation line in the quality value graph. This slope measures the marginal valuation of quality, that is, how much money the consumer would be willing to pay for another unit of incremental quality. Some consumers willing to make and receive a phone call and so have minimal demand for quality (however, they may prefer to get a brand name, but according to our definition of quality, brand name is embodied in the quality, if brand name really does mean more quality). However, these low valuation consumers would have shallow or flatter valuation lines as shown in figure-2A in below:

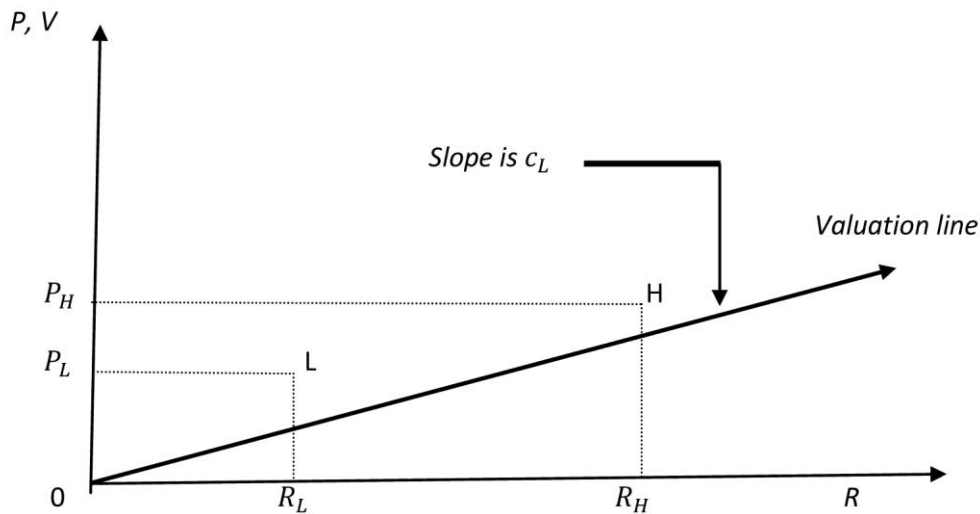


Figure-2A: Low-Valuation Consumer's Valuation Line

The intercept may still vary, reflecting how much a consumer would be willing to pay for a low quality, or in other words, how much a low-quality would be worth to each consumer. Because for a consumer who regularly uses for word processing may be quite high compared to a consumer who will only use the for playing games during idle time. On the other hand, a quantitative analyst might place a much higher marginal value, c , on additional quality so the slope of the valuation line would be very high, as shown in Figure-2B:

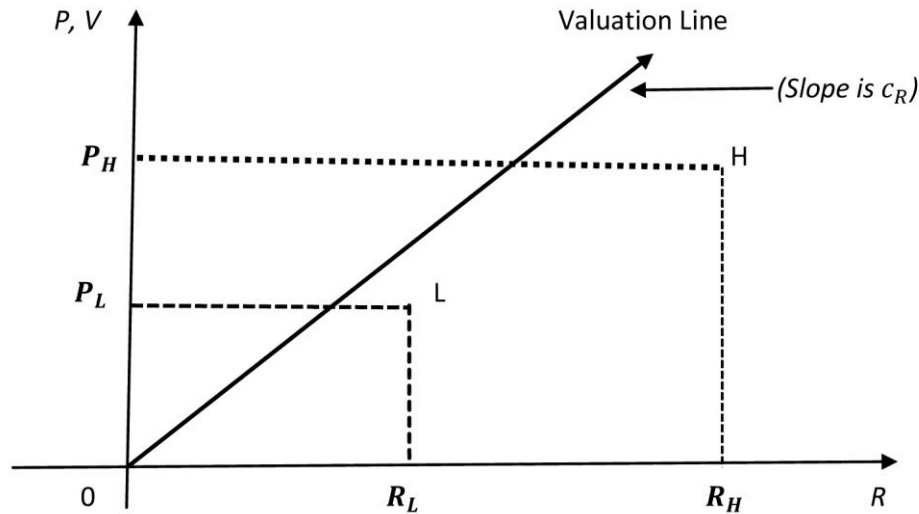


Figure-2B: High-Valuation Consumer's Valuation Line

Interpretations of Figure-2A and Figure-2B:

The consumer whose total valuation line is shown in Figure- 2A has a lower incremental valuation (denoted by c_L in the Figure-2A) for smartphone's quality, such as RAM. A slow is almost as valuable as fast one. The low valuation consumer might intend to use the smartphone for simple private communications only. On the other hand, the high-valuation consumer wants to use the phone's video conference capabilities heavily so the high-valuation consumer is willing to pay a higher marginal price for quality. As a result, $c_R > c_L$.

For the time being, let us ignore possible intercept differences for further simplification of the problem. They do exist in the real world but complicate the initial analysis of our model of a market differentiated vertically by product quality. Let's assume that all consumers have the same vertical intercept at zero (that is, $V_{0i} = \mathbf{0}$), and they differ only by the slope of their valuation lines, c_i . This forms the foundation of our analysis of quality based differentiated products. Consumers are also assumed to value different smartphones in terms of their quality attributes, which all consumers are assumed to be able to determine accurately. Since all consumers are prudent, they all place zero value on a smartphone with zero quality. However, different consumers do place different marginal value on increments of quality. These marginal valuations are assumed to be constant for a given consumer but can vary among consumers. With these theoretical basics, we can now analyze consumer choices among available smartphones with different specifications or quality attributes what we term quality (WAQI). The proposed model assumes that retailers do not change their margin to affect the price.

4. Segmentation in a Quality Differentiated Market

Consider the two suppliers shown in the quality attributes space at L and H , low and high-quality (or low or high-powered), as shown in Figure-1, 2A, and 2B. It is important to mention here that in many cases equilibrium locations for the outputs of different types

of products are necessary to analyze pricing behavior in vertically differentiated products. But the locational factors do not matter within Dhaka city for smartphone markets since the cost of transport is negligible. Thus, we are not incorporating in our analysis the location choice model for vertically differentiated products. However, now we need to determine in our model what the results are in terms of customers and pricing in our quality-based differentiated smartphones? Suppose each of two types of smartphone is priced at the level P_L and P_H respectively for low-quality and high-quality phones, as shown in Figure-3. Consider a consumer (such as one who uses the smartphone only to make and receive calls) place low value on quality attributes such as the consumer in Figure-2A. For this consumer, the lower quality supplier located at L in Figure-3 makes the most sense as this yields the most benefit above price. It is pertinent to note here that it is possible for the low-quality producer to set price for such a phone to get entirely out of the market. This would happen if the producer chooses a price such as P'_L , yielding a price quality pair at L' in the diagram. At this price the low-quality producer would not be able to sell to this low-valuation consumer. At a high enough price (such as at a price equal to higher than P_H), the low-quality producer (that is the producer of type L) would not be able to sell to anyone. In this situation, the high-quality (that is, the producer of type H) would have the whole market.

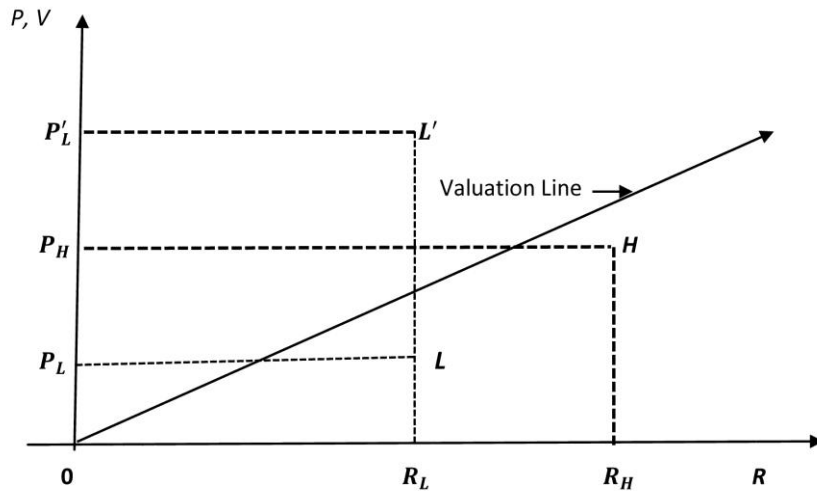


Figure-3: Consumer Choices of Price-Quality Combinations

This consumer's valuation line is relatively flatter (that is, less steep). The two phones available are shown as price-quality points in the plane. The consumer receives the most net benefits from the L rather than from H and thus would choose to buy an L . Consumers with valuation lines less steep than this one, but still pass through or above point L , would always buy the L . If the producer of L tried to charge price, P'_L as shown at the L' point in the diagram, then this consumer would not buy it.

Now let us turn to the high-quality end of the market. At the high-quality segment of the market, the seller can sell to the consumer with the highest marginal value for quality, as shown in Figure-4. This price-quality combination yields this demanding consumer the

greatest net benefit. At a higher price such as at point H' , this consumer and all others would not buy a high-quality from a high-quality producer, leaving the whole market to the producer of L smartphone. In Figure-4 consumer choice for the consumer with the highest incremental valuation of quality has been shown. This consumer's valuation line is much steeper than the valuation line of the consumer in Figure-3 who bought L smartphone. The net benefits of the H smartphone are measured by the vertical distance from the valuation line down to point H . Since this exceeds the L smartphone's net consumer benefits, this consumer would buy H smartphone (that is, a higher quality smartphone). Consumers with incremental valuations between this consumer and the consumer in Figure-3 who bought L are segmented into two groups: those with steeper valuation lines buy H (that is, high-quality smartphone) and those with less steep valuation line buy L phones (that is, low-quality phones). Even the consumer with steeper valuation line would not buy the H phone at price above his/her valuation line such as at price H' or P'_H .

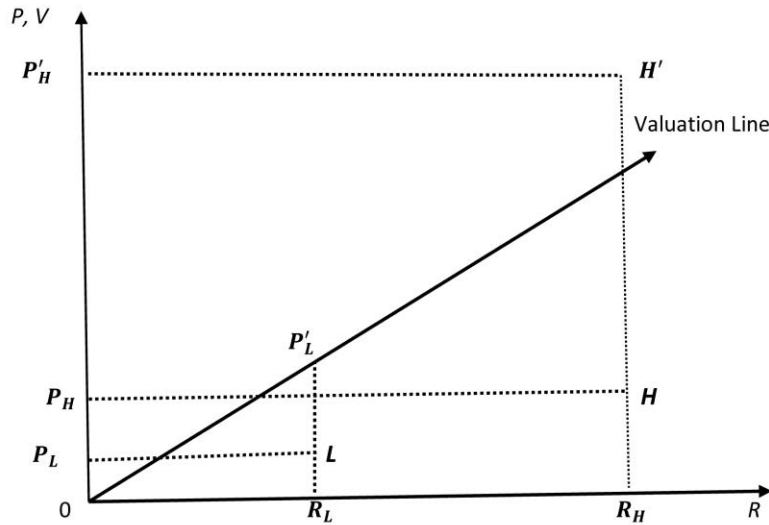


Figure 4: Consumer Choice for the Smartphone with the Incremental Valuation for Quality

At some intermediate price combinations, both firms can sell and segment the market between them (or one firm can sell and segment the market between low-quality and high-quality smartphones). The low-quality phones will be sold to consumers who value quality less, for instance, to a consumer who wants to use phone for just making and receiving calls daily or once in a while. Figure-5 shows this result, reflecting the equilibrium assignment of consumers to each type of smartphones.

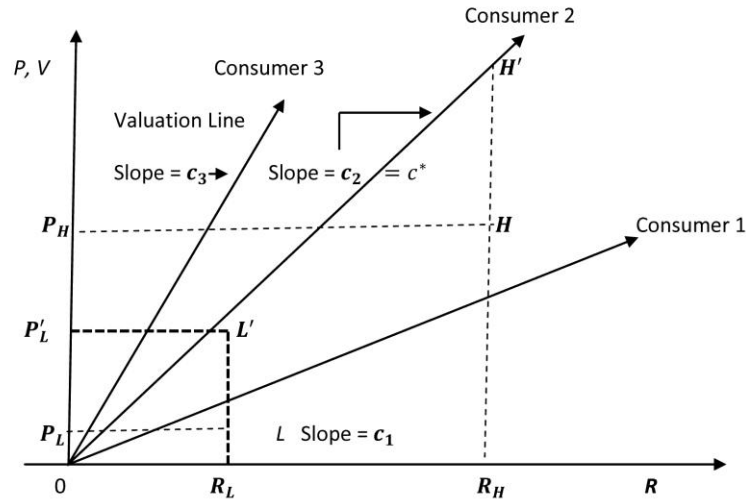


Figure 5: Equilibrium Market Segmentation

The lowest-valuation consumers buy from L , as do all consumers up to some threshold marginal valuation level. Now, how can we determine this threshold level c^* ? At the marginal value of incremental quality, the consumer would be indifferent between buying a low quality, L , and a high-quality, H . The net benefit a consumer perceives from the purchase of a product is the vertical distance between his valuation line and the product's price-quality point (a point such as L or H in Figure-5) between each one and the consumer valuation line to be the same—that is, the net benefit measured in terms of less expenditure or price derived from L and H must be identical.

In Figure-5 above, consumers 1, 2 and 3 vary only by the slope of their valuation line, representing the incremental value of quality to each of these three consumers. The valuation line of the middle consumer (consumer 2) has been chosen so it is the same vertical distances above point L and H . That is, the vertical distance $LL' = HH'$. Since these vertical distances measure the net consumer benefits resulting from a purchase, consumer 2 is indifferent between buying L and H , since both give this consumer the same net benefits measured in terms of price. The slope of consumer 2's valuation line, c_2 , is the marginal value denoted by c^* . All consumers with the valuation steeper than c^* (such as consumer in our Figure-5) would buy H (high quality). On the other hand, all consumers with valuation lines less steep than c^* (such as the consumer 1 in our above diagram) would buy a low-quality, L , or not at all. The value c^* thus segments the consumers between those who buy low quality, L , and who buys high quality, H .

With the help of simple algebra, we can precisely determine the value of this threshold value c^* , we, by now, already know that all consumers who are indifferent between low-quality and high-quality smartphones (denoted by L and H in this paper) have valuation lines with same slope c^* . Consider a consumer getting zero benefits from either type of smartphone. This consumer's valuation line passes through points L and H in Figure-5. Then the slope of this consumer's valuation line must be equal to c^* which is needed to calculate. The slope of a straight valuation line is simply the vertical distance between the height point L & H , divided by the horizontal difference between the two points. The

vertical difference is the difference in the prices of the two products, which can be expressed as ΔP :

$$\Delta C = \Delta P = P_L - P_H \quad (3)$$

The horizontal difference is nothing but the difference in the quality levels of the two smartphones, ΔR :

$$\Delta R = R_H - R_L \quad (4)$$

The slope of the valuation line passing through L and H , which determines c^* , is thus:

$$c^* = \frac{\Delta C}{\Delta R} = \frac{\Delta P}{(R_H - R_L)} = \frac{(P_H - P_L)}{(R_H - R_L)} \quad (5)$$

This is the boundary valuation slope between those consumers who buy the phone at L and those who buy at H . It is important to note the market segmentation: all consumer with marginal values for quality above c^* buy from H (that is, buy a high quality), while all consumers with marginal values below c^* buy from L (that is, buy low quality).

Thus, we find that the marginal valuation for quality create a signal-dimension measure of consumer willingness to pay for quality, and the two types of smartphones—low-quality and high-quality phones completely segment the market into two parts. It is pertinent to mention here that we have, in our analysis, considered only two types of smartphones in terms of quality—low-quality and high-quality, despite the fact that in reality we may have a continuum of quality-based smartphones. Such treatments of only two types of phones will not change our conclusion, since it is always possible to categorize all smartphones into two distinct groups—low quality and high quality on the basis of WAQI constructed from the relative weights assigned by consumers to various specification of different smartphones. Here brand image is not required to be considered separately, for prices of the phones include a premium for brand names. In addition, we can either think of two groups of producers—one producing low quality phones and the other producing high-quality phones; or of each producer producing both types of phones. In either approach, our analysis remains unchanged—that is, markets will be segmented completely. The only difference is that in the second approach, location factors measured in terms of transport costs do not matter even when they are quite significant.

Now let's come back to another important issue of our analysis. If we had allowed the vertical intercept, V_{0i} as well as the slope of valuation lines, c_i , to vary, our result would still be identical. Because, if we do so, consumer would be defined by two parameters, the intercept and the slope of the valuation line. Certain values of the parameters would still make consumer just indifferent between the types of smartphones. All the consumers with slope parameter greater than c^* buy the H , and the L phones. On the other hand, the difference in intercepts of the valuation lines only determine whether they (the respect consumer) would buy a phone at all, no matter it's an L or an H phone.

In our analysis, consumers have been shown to choose between the available phones by purchasing the one with highest net valuation over price (that is the one with highest net benefit). In the total valuation-quality graph, the smartphones that may be purchased is the ones whose price-quality location is below a consumer's total valuation line. The one

furthest below the valuation line is the one chosen by the consumer since it would give the consumer the highest possible net benefit.

If two different phones are available in the markets and both are purchased by some customers, then the typical result is for potential buyers to segment themselves into groups differentiated by their marginal valuation of quality. Consumers with a lower marginal value would choose the lower-quality phones, while consumers with higher marginal value would choose the higher-quality phones. Consumer always would be split into two groups, fully segmenting the smartphone markets on the basis of quality.

5. Equilibrium Price

As we have mentioned earlier that we can consider two firms in the market, each producing either a low-quality or a high-quality smartphone. Once the market is segmented, firms are also segmented, although one firm may produce both types of smartphones. However, our analysis would not break-down if we treat that there are two firms, one producing low-quality and another producing high-quality phones. Now if one firm wishes to change the price of its smartphone it is charging—given what its competitor is doing—then the situation described in Figure-5 may not be represent a complete equilibrium.

In this section, we will determine the equilibrium price assuming that producers do not change the specification (or quality) of their phones. We also assume that there will be no new phones in the market.

In our analysis, each firm has to take its competitor into account when setting the price. Suppose a firm believes its competitor's price would not be changed as it changes its own price. Each firm then has a well-specified profit maximization problem to solve.

The solution is the usual one for a monopolist—equate marginal revenue to marginal cost. Since each firm is doing this, we can solve for a firm producing a low-quality, L , smartphone and the result will hold for all type of firms:

$$MR_L = MC_L$$

$$MR_L = P_L + Q_L \times \left(\frac{\Delta P_L}{\Delta Q_L} \right) = MC_L \quad (6)$$

From equation (5), we find that the responsiveness of L 's price, P_L , to change in the quantity sold, Q_L , is just reciprocal of the number of customers lost when the firm change its price. As the producer of L raises its price, P_L , it loses customers at the boundary in terms of their valuation of quality. These consumers have marginal valuation c^* shown in Figure-6 below. Figure-6 shows the distribution of consumers against various marginal valuations or slopes, c_i where $f(C)$ is the distribution function with a minimum and a maximum C value. The number of these consumer is shown by the height of the distribution function, $f(C)$, in the Figure-6. At each c_i , $f(C_i)$ represents how many customers have the marginal valuation c_i for quality.

Explanation of Figure-7: The valuation line for the consumer who is indifferent between smartphones L and H has the slope c^* , as does the line segment connecting point L and H . If the price of L rises by ΔP , then the boundary consumer would now be a consumer with lower slope— $c^* + \Delta c$. It is the slope of the line segment connecting with L' price–quality point and H , which is ΔR . From the standard rise over run formula for the slope, the change in c^* (that is, Δc) must equal the price change (ΔP_L) divided by the horizontal distance (ΔR).

Similarly, a change in the location of the boundary valuation level can easily be transformed into a change in quantity sold. A small leftward movement of the boundary valuation increases sales of L phones by the size of the movement (Δc^*) times the density of consumer, $f(\Delta C^*)$.

We can now solve this to find the relationship between price change and quantity sold (that we need to put into our equilibrium expression):

$$\frac{\Delta P_L}{\Delta Q_L} = - \frac{\Delta R}{f(C^*)} \quad (9)$$

Putting this expression of equation (6) into the marginal revenue formula gives us the following equation for the profit–maximization choice for L :

$$MR_L = P_L - Q_L \times \left(\frac{\Delta P_L}{\Delta Q_L} \right) = P_L - Q_L \times \left\{ \frac{\Delta R}{f(C^*)} \right\} = MC_L \quad (10)$$

Solving for the price, P_L , we get

$$P_L = MC_L + Q_L \times \left\{ \frac{\Delta R}{f(C^*)} \right\} \quad (11)$$

Thus, we see that the profit-maximizing price choice exceeds marginal cost by an amount depending directly on the size of the firm's market and the difference between the qualities of the smartphone of the firms. This helps us understand the initial quality choice each producer as it entered the market. If we suppose the price equation just derived were known before the firm entered the market and set its quality attributes for its product, then each firm would maximize its expected profit by maximizing the difference in quality attributes between the firms. For example, suppose one firm is already producing a very low quality. A new entrant would do best by varying its product's quality as much as possible. It would do so by introducing the highest quality it can do at a reasonable cost. This result is also affected by the marginal cost of producing quality. For instance, the marginal cost to produce a phone with 4 GB RAM instead of 2 GB RAM—other quality attributes remaining unchanged—would cost much more than the cost of producing a 2 GB RAM phone. It is obvious that, *ceteris paribus*, the higher the quality, the higher the marginal cost of each unit of smartphone. Once marginal cost starts increasing rapidly with increases in quality, this determines the limit on the firm's attempt or ability to maximize the quality difference between itself and the already existing (incumbent) firms.

Second, we find from equation (11) that price is inversely related to the density of consumers at the break between the firms, or L and H phones, $f(C^*)$. If the density distribution is like that shown in Figure-8, with two modal peaks in terms of the valuation of quality, then a likely equilibrium in quality attributes is available for one firm to enter

near each mode—one near the low mode and the other near the high mode. Each of these new entrants could charge a higher price with little loss of consumers at the boundary of the market areas. The marginal cost implications might move them slightly left or right, but the equilibrium would almost certainly be bimodal (having two peaks of quality) with each producer near the modes, but pushed away from each other by the implications of ΔR as argued in above paragraph.

These results are a useful characterization of quality-differentiated product competition. Each firm charges a price like a simple monopolist as we have assumed that each firm is the only producer of a particular product with a given WAQI, taking the other firm’s quality-price pair as given. Knowing this result enables us to understand the initial quality-difference decision. If the firms are further apart in terms of quality attributes, then each firm charges a higher price at the monopoly solution, and the resulting larger profits create a repulsion force driving the firms to deviate further away in terms of quality attributes from one another. This repulsion of competition from the other producers is traded off by the high-capability producer against increases in the marginal cost of better quality.

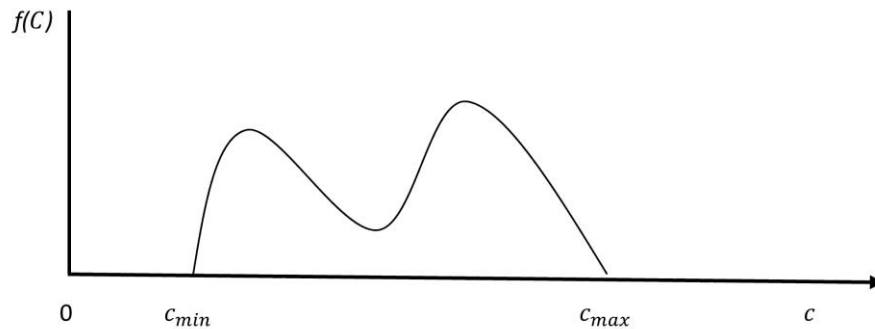


Figure 8: Bimodal Distribution of Consumers with Slope, c

6. Technological Change and Product Differentiation

An existing or incumbent firm or potential entrant can invest in R&D. This investment would enable the firm to produce a new smartphone with a higher level of WAQI at lower marginal cost. However, the question is: how might this R&D investment activities to introduce a better smartphone affect competition?

Suppose an existing firm that is producing or selling high-quality smartphone, H , but does not invest in R&D. At this point we need to assume that the R&D activities do not create any *network externalities* in the market. In other words, we assume that a new smartphone is compatible with existing features of the low-quality version. It is also assumed that once a new and higher-quality phone is introduced, the firm terminates the production of its existing phone at H . It is important to remember here that lowering marginal cost of quality affects the profit-maximizing price choice even with the old one. The equation for the profit- maximizing price is:

$$P_H - Q_H \times \left[\frac{\Delta R}{f(c^*)} \right] = MC_H \tag{12}$$

If the firm lowers its marginal cost for quality, the profit-maximizing price would also be lower, increasing the size of its market—which is clear from equation (12). But what is not revealed from the equation that the lower marginal cost of high-quality smartphones also affects the profit-maximizing location in quality space. This choice was determined by the trade-off involving marginal costs increasing with the quality. With this increase—now the increase is lower than before because of R&D—the firm would relocate to higher-quality location or level. The firm would try to gain maximum profit by getting as far away from its competitor as possible in terms of quality, that is, in terms of ΔR , trading off the resulting increase in profits through a higher price with the loss of market area and the increase in marginal cost as quality is increased.

The analysis in this section (Section 6) can be summarized as follows: Any new firm trying to enter this market would do best with a strategy of technological innovation, at either the high-quality end or the low-quality end of the quality space. Entering between two incumbent firms—or two-quality space—forces them to lower their own prices and squeeze the new entrant's market area and price. The lower sales and price could cause the new entrant losses unless it had a cost advantage over the already existing firms. Given their learning/experience curve advantages (if any), the incumbent firms should be able to do at least as well on cost as any new entrant. If this is so, then entry at an intermediate quality level is unlikely to occur in a quality-differentiated market.

Another result of our analysis is that entry into an existing quality-differentiated market is likely to occur at the market's peripheries. Pushing the envelope of technology by producing a new quality dimension is one type of entry, but making the technology available to entirely new groups of consumers by introducing a new, lower-price, lower-quality product can be revolutionary. Mass market product, like a smartphone, can change the world and that we see it.

Competition in a market differentiated vertically by quality is likely to occur by technological means. A firm trying to get ahead of its rivals in a quality specification can increase market share and the price the firm can charge. Entry into a market that has incumbents is like to occur at the high-ends and low ends in term of quality. A cheap, low-quality smartphone may enter a market in which incumbent firms have concentrated too much on moving toward higher quality. If incumbents have failed to push technology as rapidly as it can be pushed, then an entrant may be able to enter at the high-quality, high-price end of the spectrum. “When Cadillac failed to keep its product up to world-class standards, Mercedes-Benz was able to enter the automobile market in the United States and challenge Cadillac's position as the American symbol for quality and high price” (Rosenthal, 1988).

7. Product Quality Differentiation in Two Dimensions

Now we are in a position to extend our analysis to two-dimensional quality-based vertical product differentiation. Consider a phone with several quality attributes, such as camera, RAM, and storage. With two distinct supplies in a specific attribute, complete market segmentation occurs. All consumers who place a relatively low valuation on the attribute (in terms of how much each would be willing to pay for another available unit of that attribute), purchase from the lower-quality supplier. It is pertinent to note that marginal unit does not mean one additional unit, rather it means the next available units, e.g.4 GB,

RAM, 6 GB RAM, etc. However, all consumers with high valuations for the quality attribute or specification buy the higher-specification smartphones. These results generalize to groups of consumers whose tastes vary in terms of several parameters instead of just the marginal value of the specification: “*the set of consumers can be divided into two groups in terms of their demand parameters, with each buying only one smartphone*” (Rosenthal, 1988).

Prices are determined by each firm, assuming the other firm would not respond to its own price change. With this Cournot assumption, each firm acts as a simple monopolist, equating marginal revenue to its marginal cost. The set of equilibrium prices helps the firm understand the profit-maximizing choice of specification or quality attribute smartphone to produce. Each firm can charge a higher price the further apart they are in quality attributes or WAQI. This repulsion force pushes each firm away from the other. But each sacrifices market share by moving further away, which creates a trade-off against the force of repulsion. In addition, the rate at which marginal cost changes with the change in a quality attribute helps keep the firms from going to the limits of the possible specifications or WAQI.

Adding more dimensions or attributes of quality differentiation doubles the number of standard phones that can survive in equilibrium for each additional quality attribute. But the continual innovation in the smartphone market never allows it to come to rest completely. Instead the gradual decrease in quality attribute’s marginal cost causes an increase in the lowest quality units’ capabilities and if feasible the highest quality attribute phones’ as well. The whole market often shifts to higher quality in terms of overall WAQI. “Potential mass consumer items may stay with low quality products with the lower cost allowing the reduction in price to react against a price elastic demand curve.” (Rosenthal, 1988).

8. A Numerical Example of the Valuation Line and the Price Line

To empirically estimate the valuation line, all the cross products have been avoided due to fact that the marginal cost of a cross product (as a new product) is very low but the customer fails to make rational valuation of such a new product. **Cross Products** refer to those products that are produced by a new way of assembling the different parts and components of existing products. Cross products are generally developed to increase variety (Alam, 2009). To differentiate smartphone in terms of quality (that is, for vertical product differentiation in terms of quality), three major dimensions have been considered. These are 1. RAM, 2. Storage, and 3. Camera (Front and Rear). The display size is very important but is not by definition a quality attribute. Thus, it has not been considered. We have chosen the five types of smartphone devices that are quality-differentiated and these are described in Table-1.

To collect the data on these five smartphone devices, 90 respondents irrespective of gender, age, marital status, profession, income, and education have not been considered. Only adult men and women who are knowledgeable about these smartphone sets have been chosen conveniently due to unavoidable reasons only from *Jamuna Future Park*. To record their responses on quality (WAQI) and Valuation, the following continuum has been used:

The Continuum

The Continuum ranging from 0% to 100% with a 20% break (the Continuum is in percent)

| | | | | | |
|---|----|----|----|----|-----|
| 0 | 20 | 40 | 60 | 80 | 100 |
|---|----|----|----|----|-----|

In calculating WAQI, simple arithmetic mean of the assigned value multiplied by the average weight has been considered. However, as a benchmark, one smartphone has been used as a benchmark product or base product to avoid “cross products” and “copy products”.

The WAQI = $\frac{\sum_{i=1}^{90} Q_i}{90} \times \frac{\sum_{j=0}^{100} CV_j}{90}$, $i \neq j$ for each of our three quality dimensions,

Where: Q_i = Relative weight of importance of a quality dimension such as the RAM, CV_j = cardinal value of one quality dimension, such as the RAM assigned by a respondent on the continuum. It is to be noted that we have three quality dimensions: RAM, memory, and camera (front & rear). Thus, we had to add them up to get the WAQI of a smartphone.

The Average Valuation is nothing but the arithmetic mean. Prices are also the arithmetic mean of the prices of different sellers.

Table 1: Survey Data of Five Smartphones Collected from 90 Respondents (Jamuna Future Park, Dhaka)

| Quality Attribute | Huawei Y5 Lite (Base Product) (1) | Motorola Moto E5 (2) | Samsung S6 (3) | Samsung Galaxy M40 (4) | Vivo S1 (5) |
|-----------------------------------|---|----------------------------|-------------------|------------------------------|----------------|
| RAM | 1 GB | 2GB | 3 GB | 6 GB | 6 GB |
| Storage | 16 GB | 16 GB | 32 GB | 128 GB | 128 GB |
| Camera (Front and Rear) | 8/5 MP | 13/5 MP | 16 MP/5 MP | 32/16 MP | 16 MP/32 MP |
| Average Valuation (Thousand Taka) | 2.00 | 3.60 | 10.00 | 15.00 | 25.00 |
| Average Price (Thousand Taka) | 8.00 | 14.00 | 22.00 | 25.00 | 30.00 |
| WAQI | 2 | 5 | 9 | 15 | 25 |
| Valuation/Price | 0.2500 | 0.3286 | 0.45 | 0.6000 | 0.8333 |
| Valuation/ WAQI | 1.0000 | 0.9200 | 1.1111 | 1.0000 | 1.0000 |
| Price/WAQI | 4.0000 | 2.8000 | 2.4444 | 1.6667 | 1.2000 |

The first smartphone described in Table above will disappear from the market very soon unless its price is reduced, since its Price/WAQI = 4.00, which is extremely high (we need something around 1.00). At the same time, Valuation/Price = 0.25. So, we get its Valuation/WAQI = 1.00 exactly. These imply that customers are very prudent in assessing the valuation as well as WAQI, but the company is charging very high price compared to its quality. Our findings also show that high valuation consumers are willing to pay high premium for branded phones since they pay more than their valuation for high quality phones compared to low quality phones (item #4 and #5). In addition, their marginal valuation for quality is decreasing suggesting the elimination of the smartphone at the lower end of the high-quality space. If we consider #3 and #4 phones: $\frac{\Delta c}{\Delta R} = 1$. This is the equilibrium threshold value of c^* between the third and the fourth phones

without a common valuation line with the slope of 1.00 (that is, a 45° line). It is also found that companies can produce low quality and sell them at a lower price. These low-quality producers, thus, can survive in the market avoiding the competition from high quality phones, because in Bangladesh there is still a very high demand for low quality, cheap phones among the consumers who want to use them for occasional verbal communication and internet along with YouTube only or for playing games during leisure time. Some consumers are interested to buy a phone within the price range of the Taka 15-20 thousand for their kids. We find that in case of our five smartphones, the Valuation/Price ratio increases as we move from lowest one to the highest one. But the interesting fact is that the Price/WAQI ratio is decreasing (or WAQI/Price Ratio is increasing) as we move from lowest one to the highest one. This implies that low-quality phones are charging more price above the valuation line. The prices of these lower-end products (the first three) must be reduced to survive in the market. The Valuation/Price ratio also states that lower quality phones charge prices much above the Valuation Line. As the quality increases, the distance between Valuation Line and price declines but the price still remains above the valuation Line. The fifth phone (high-quality one) is much safe. However, in the long-run it will have to reduce price a little bit to be competitive with other high-quality phones. Its price is slightly above the Valuation Line. Some may argue that in Bangladesh VIVO is a strong brand nowadays and thus, consumers do not mind to pay a little bit higher price as brand premium. This also supports our proposed theory. On the other hand, in case of the last two high quality phones, the Price/WAQI and the Valuation/Price ratios are also increasing. The market is expected to be differentiated between the first two lower-end phones. But there is a discontinuation of the decreasing pattern after the third which suggest that the equilibrium threshold c^* would be in between the third and fourth. Or the market is expected to be differentiated between the first three (lower quality) and the last two (high quality). Given these five types of phones, we can calculate the equilibrium threshold value of c^* between the third and fourth without a common valuation line which is $= \frac{\Delta c}{\Delta R} = \frac{29.78}{35.00} = 0.8223$. Between fourth and fifth, there will be common valuation line with the slope of $\frac{\Delta c}{\Delta R} = \frac{10}{10} = 1$. Thus, it is possible to predict that the 4th one and the 5th one will create a high-quality based vertical market differentiation with a unique equilibrium by adjusting their competitive prices. On the other hand, the market is expected to be differentiated between the first two lower-end phones. Since the equilibrium threshold value of c^* between the third and fourth without a common valuation line which is $= \frac{\Delta c}{\Delta R} = \frac{29.78}{35.00} = 0.8223$, another thing that we can expect that the third one will merge with the lower-end segment or higher-end segment by adjusting quality and/or price as soon as possible, if the company wants to market this one with a new form of quality-price combination. Thus, our analysis would help understand the quality-based competition between vertically differentiated products, that is generally very common in monopolistic markets.

9. Conclusion

The proposed model concludes that consumers in a vertically differentiated market of smartphone makes the decision to buy or not to buy a smartphone depends on the difference between the quoted price and the valuation of that particular smartphone. If the price of the smartphone is less than or equal to perceived consumer driven valuation

(PCDV), the consumer will buy the smartphone. This is true for both high quality consumers and low quality consumers. Consumers who prefer high quality will buy a high quality smartphone subject to condition that the price is less than or equal to valuation. Similarly, consumers who prefer low quality will buy the smartphone with low quality at low price as long as the price is lower than or equal to the valuation of that smartphone. This behavior of price-valuation comparison will lead to segment the market into two distinct polarities—high-quality and low-quality. The mediocre smartphones will merge either with high-quality or low-quality.

References

- Alam, S. M. I. 2009. *Types of Some New Products We Develop as Product Development Professionals for a New Marketing Strategy*. Seminar Paper, Seminar on Product Management and QFD: The Managerial Implications, September 12-15. North South University, Dhaka.
- Bhasin, H. 2020. *Maintaining the balance between price and quality*. Retrieved on September, 12, 2020 from: <https://www.marketing91.com/price-quality>.
- Bonanno, G. 1986. *Vertical Differentiation with Cournot Competition*. Economic Notes. 15: 68-91. *CF*: Jean Tirole. 1988. *The Theory of Industrial Organization*. The MIT Press, Cambridge, USA. 296-297.
- Button, A. 2017. *Differences between Horizontal & Vertical Differentiation*. Retrieved on September 12, 2020 from: <https://bizfluent.com/info-8551470-differences-between-horizontal-vertical-differentiation>.
- Deltas, G., Stengos, T. and Zacharias, E. 2010. *Product Line Pricing in a Vertically Differentiated Oligopoly*. Paper presented in the International Industrial Organization Conference. Retrieved on September 9, 2020 from <https://www.oguelph.ca/economics/sites/uoguelph.ca/economics>.
- Dennis, Z. Y. 2012. *Product variety and vertical differentiation in a batch production system*. International Journal of Production Economics: 138/2, August, 314-328.
- Gal-Or. E. 1983. *Quality and Quantity Competition*. Bell Journal of Economics, 14: 590-600.
- Gapszewicz, J. and Thisse, J. F. 1979. *Price Competition, Quality and Income Disparities*, Journal of Economic Theory, 20: pp. 340-359. *CF*: Jean Tirole. 1988. *The Theory of Industrial Organization*. The MIT Press, Cambridge, USA. 296-297.
- Gapszewicz, J. and Thisse, J.F. 1980. *Entry (and Exit) in a differentiated Industry*, Journal of Economic Theory, 22, pp. 327-338. *CF*: Jean Tirole. 1988. *The Theory of Industrial Organization*. The MIT Press, Cambridge, USA. 296-297.
- Gapszewicz, J., Shaked, A., Sutton, J., and Thisse, J.F. 1981. *A Detailed Study of Nash Equilibrium*. Discussion Paper 81/37, ICERD, London School of Economics.
- Nicholas, W. 1951. *Price Policies in the Cigarette Industry*. Vanderbilt University Press, Nashville, USA. 189-195.
- Raphael, A. and Auer, S. 2017. *Dynamic entry in vertically differentiated markets*. Journal of Economic Theory: 167, January, 177-205.
- Rosenthal, R. 1988. *Asymmetric Information and the Market Failure*. Mimeo. Economics Department, Boston University, Boston, MA, USA. *CF*: lecture on selected topics in Applied Microeconomics.
- Shaked, A. and Sutton, J. 1982. *Relaxing Price Competition through Product Differentiation*. Review of Economic Studies. 49, pp. 3-13. *CF*: Jean Tirole. 1988. *The Theory of Industrial Organization*. The MIT Press, Cambridge, USA. 296-297.
- Tirole. J. 1988. *The Theory of Industrial Organization*. The MIT Press, Cambridge, USA. pp. 296-300.

