

Volume 10
Issue 1 & 2
2019- 2020

ISSN 2311-3626

Jagannath University Journal of Social Sciences

জগন্নাথ ইউনিভার্সিটি জার্নাল অব সোশ্যাল সায়েন্সেস

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**Faculty of Social Sciences
Jagannath University**

Dhaka-1100, Bangladesh
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Jagannath University
Journal of Social Sciences
Volume 10, Number 1&2
Faculty of Social Sciences
Room#717, New Academic Building (6th Floor)
Jagannath University, Dhaka-1100, Bangladesh

Published in February 2023

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Price: BDT 200.00 (US\$ 5.00)

Printed By :
Color Graphic
59/3/5, Purana Paltan, Dhaka-1000.
E-mail : cgraphic@bol-

Jagannath University
Journal of Social Sciences

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Employment Opportunities and Human Development of the Rural Women in Bangladesh: A Case Study

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Submission: 27-10-2020
Acceptance: 28-02-2022

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Abstract: *The relationship between employment and human development is mutually beneficial. The goal of this study is to find out how working capability contributes to and ensures human development in Bangladesh. Employment opportunities generate income, which helps to alleviate poverty and ensure long-term development. The study also looks at the relationship between employment opportunities and Bangladesh's human development prospects. Primary data, in addition to secondary documents, were used for this study. A total of 120 women from rural areas of Bangladesh were purposefully interviewed for this study using a semi-structured questionnaire. The observation method was also used to learn how employment opportunities assist women in developing their livelihoods in the country. The study reveals that employment opportunities are inextricably linked to issues of human development. Working women, for example, generate income that helps women to make better decisions in their families and society. Workable women are also capable of caring for others, which strengthens social cohesion and bonds within families and communities. Women who are able to work, for example, are capable of providing social and financial support to their families. Finally, the study has also discovered that having a job allows women to fully participate in society while also providing them with a sense of dignity and worth. Finally, the study suggests that the Bangladesh government should provide more job opportunities for Bangladeshi women, particularly rural women, in order to protect them from vulnerabilities.*

Keywords: Bangladesh, Employment opportunities, Human development, Rural women

1. Introduction

Women generally constitute half of the total population in Bangladesh and they are the most substantial part of the social structure. In 2017, the population of Bangladesh is estimated 162.7 million, women are 81.3 million and men are 81.4 million making it one of the densely populated countries in the world (Akter and Islam, 2019: 5). Despite the fact, women in third world countries usually face a number of barriers and obstacles in their way to avail their rights. Although Bangladesh is a developing country and women almost constitute half of the population here even if they are truly neglected in every sphere of life. Continuing disparities between women and men in life expectancy, income, education, asset, personal security and participation in the political process have a devastating impact on development. According to the constitution of Bangladesh, all citizens are equal before law and are entitled to equal protection of law (Bangladesh Constitution, Article-27). In recent years, women's economic, political, social and cultural condition presents a gloomy picture. Everywhere in the streets, markets,

offices, factories and social and political gatherings it is man who is always seen and engaged in working. The rural women are also neglected both in their public and private lives. In the existing socio-economic, cultural framework and educational backwardness, they cannot properly exercise their political rights despite the status recognition behind those (Khanom, 2006: 1). A handful of studies show that the traditional socio-cultural practices limit the opportunities in women's education, skill development, employment and participation in the overall development process of Bangladesh. The Bangladesh government has recently paid much attention to women's empowerment. The challenge is that 70 percent of the Bangladeshis still live in rural areas and they are illiterate with low status in the society. The majority of rural women live under the burden of poverty, hunger and malnutrition. Women's participation in the workforce has increased, but the number of women in decision-making positions is comparatively low. Those women who have no control over their assets and decision-making process cannot complete their own education required for gainful employment. Women have, therefore, unequal access to and control over resources in development efforts and programs. Therefore, the study attempts to deal with the nexus between women's employment opportunities and their human development in the comparative perspective of rural Bangladesh. More concretely, the study explores how rural women in Bangladesh independently make their free choices in their socio-political structures.

2. Objectives of the Study

The proposed study is concerned with establishing a relationship between the employment status of women and the six pillars of human development viz. equity, sustainability, productivity, empowerment, cooperation and health security in the context of rural Bangladesh. However, the main objective is to investigate and analyze the relationship between women employment opportunities and human development in rural Bangladesh and to analyze how and to what extent better employment opportunities for women contribute to greater decision-making power in the family and societies.

3. Research Questions

The study mainly focused on the following key questions:

- a. What is the status of women employment opportunities in the context of rural Bangladesh?
- b. How have the socio-economic and cultural factors, i.e educational background and literacy rate, patriarchal and kinship structure, social customs as well as norms, values and, nature of job created barriers in getting jobs for rural women in Bangladesh?

4. Literatures Review

Relevant literature on women empowerment in relation to human development issues have been reviewed for the study. Shahiduzzaman (2003) discussed the gender equality and social structure of Bangladesh. The author found that there is gender inequality in every sector of life in both rural and urban sectors of Bangladesh. Patriarchal system is

the main cause of gender inequality. The author focused that male are get more opportunity than females in family and society and males take all important decisions in the family. Author also discussed the marriage system, decision-making system, economic system and economic contribution of a male or female, power practice and power relationship of society. Judge (2003) highlighted the globalization issues in relation to Indian women who have been working in the job sector. The authors analyzed how poverty and Indian social structure are interlinked with women employment status. The author also discussed that the Indian government has recently formulated sustainable public policy that greatly helps empowering women in India. Chaudhury & Ahmed (1980) focused on the role of women in the social and cultural setting of Bangladesh. In this book, the authors discussed the economic value of women and their control over means of production. Marriage customs and legal rights of women, divorce, dowry system, and educational status of women are also discussed. In addition, this book introduces the history of women's organized movement in Bangladesh. The authors also discussed the problems facing working women, attitudes towards female employment, development programs for women, government policy for women, male-female differences in marital pattern, relationship between female education and fertility. Swarna (2015) especially focuses on Gender equality and human development in rural and urban context of India. India is experiencing the spread of rural distress. It is mainly due to the collapse of the agricultural economy. Structural adjustments and competition from large-scale enterprises result in loss of rural livelihoods. Poor delivery of public services and safety nets, deepen the distress. This paper also examines the adverse impact of the events in terms of endowments, livelihood opportunities and nutritional outcomes on women in detail with the help of chosen indicators at two time-periods roughly representing mid-90 and early 2000. Abdullah (2014) highlighted women empowerment as the reflection of gender equality, which is the precursor to moving the country forward, towards middle-income status, towards inclusive and sustainable development. The author highlighted that the Constitution of Bangladesh also grants equal rights to women and men at every sphere of public life. The author also mentioned that Bangladesh was ranked 8th globally in terms of political empowerment of women due to the government's pro-women policies.

It appears in the above reviews that no remarkable research has yet been conducted in the context of Bangladesh focusing on the issue of employment opportunity in relation to human development activities. Therefore, the present study will certainly fill the gap.

5. Methodology

This research is mainly qualitative in nature. It explored how the working capability of women contribute to and ensures human development in Bangladesh, why rural women are deprived of receiving employment and how they are deprived. The study explores the

unknown things through the mosaic of narratives and views of the rural women, public policy makers and relevant stakeholders about what they think about women empowerment in relation to human development in the perspective of Bangladesh. In addition, the study has also used relevant literature as secondary sources.

5.1 Data collection methods

A qualitative method of data collection has been used for this research. An in-depth interview method has been applied with the women who are currently living in rural areas of Bangladesh. Observation method was followed in the study. A total of 120 women from rural areas of Bangladesh were purposefully selected and interviewed for this study using a semi-structured questionnaire. Two typical rural villages (Bindan under the Gazipur Districts and Rowshonpur under the Panchagarh) were selected as the study area. Total area of the villages is about 5 square kilometers. Some local institutions like mosques, clubs and some NGOs like Proshikha, BRAC, Karitas and Grameen Bank are functioning in these villages. Purposive sampling strategy has been used in selecting research fields to gather required information. The information has also been collected regarding women's educational background, age, sex ratio, what jobs rural women do, why women are deprived and neglected in families and job markets and so on.

5.2 Data presentation and analysis

The collected primary data has been analyzed using content and thematic analysis methods. Content analysis method helps compiling the segregated data into a systematic way. Some quantitative figures such as income ratio of the family households, number of family members, age, sex and so on have been presented in graph by using SPSS software. Thematic analysis technique helps to analyze respondent's views and narratives regarding the women empowerment issue in relation to socio-economic development.

6. Findings

This section represents the findings of the study that includes two parts: part one portrays the analysis of the quantitative data and part two portrays the analysis of the qualitative data.

6.1 Part one: Analysis of the quantitative data

Table 6.1.1 shows the relationship between employment opportunities based on educational qualification. Respondents who have passed secondary level of education, most of the respondents among them have employment opportunities and those who are illiterate, majority respondents among them are employed in ordinary job sectors. The Table also shows that respondents who have passed secondary and higher secondary levels of education are less employed.

Table 6.1.1 Employment opportunity by education

Education		Employment Opportunity		
		Yes	No	Others
Illiterate	14	12	2	0
Primary Level	24	8	16	0
Secondary Level	26	24	2	0
SSC	18	6	12	0
HSC	16	4	12	0
Degree	2	2	0	0
Honors	18	12	6	0
Masters	2	2	0	0

Source: Field Data, 2019

Table 6.1.2 indicates the relationship between employment opportunities based on age. Respondents whose age group is 26-30 are most likely to have employment opportunities.

Table 6.1.2 Employment opportunity by age

Age		Employment Opportunity		
		Yes	No	Others
Upto 18	14	4	10	0
19-25	42	18	24	0
26-30	24	14	10	0
31-35	18	10	8	0
36-40	10	6	4	0
41-50	10	4	6	0
50+	2	0	2	0

Source: Field Data, 2019

Respondents who are unemployed, among them 77% do not have job opportunities and most of them manage household activities shown in Table 6.1.3.

Table 6.1.3 Employment opportunity by occupation

Occupation		Employment Opportunity		
		Yes	No	Others
Unemployed	76	16	60	0
Part Time	28	24	4	0
Full Time	16	16	0	0

Source: Field Data, 2019

Marital status affects employment opportunities are shown in Table 6.1.4. The majority of the married women do not have a job and the majority of the unmarried women work outside

of the home which indicates that marriage binds women to work inside their families.

Table 6.1.4 Employment opportunity by Marital Status

Marital Status		Employment Opportunity		
		Yes	No	Others
Married	86	30	56	0
Unmarried	24	18	6	0
Divorced	4	4	0	0
Widow	6	4	2	0

Source: Field Data, 2019

How do women spend their earnings?

Table 6.1.5 Shows that respondents who work on a part-time basis, majority of them spend their earnings all by themselves and those who work permanently, most of the respondents among them spend their income together with their husbands.

Table 6.1.5 Women spend their earnings

Occupation		Women spend their earnings			
		Husband	Self	Both (spouse)	Others
Unemployed	76	69	6	0	0
Part Time	28	2	20	4	2
Full Time	16	0	4	10	2

Source: Field Data, 2019

Land ownership

Table 6.1.6 illustrates that a vast majority of women don't have land ownership by their name. That means the male dominates in holding land position in Bangladeshi society and it reflects patriarchal structure of the society where women are neglected in terms of holding land position by their name.

Table 6.1.6 Land ownership by education

Education		Land ownership		
		Yes	No	Others
Illiterate	14	0	14	0
Primary Level	24	4	16	4
Secondary Level	26	2	24	0
SSC	18	0	16	2
HSC	16	4	12	0
Degree	2	0	2	0
Honors	18	2	16	0
Masters	2	0	2	0

Source: Field Data, 2019

6.2 Part two: Analysis of the qualitative data

6.2.1 Purdah/veil system affect in getting job for women in Bangladesh

There is no different interview system for hijabis and non-hijabis women in Bangladesh for getting a job. In many Muslim communities, the Middle East countries for example, the purdah has often been used as a litmus test to determine the piety of Muslim women. Not surprisingly, women who wear the purdah are able to gain a higher level of social prestige within their Muslim communities, while the public display of their faith has made them more susceptible to discrimination in Western society. Although in Bangladesh, wearing purdah by a woman does not affect her getting a job but it is often seen as a traditional outfit. Sheikh Sultana, who is the age of 33, said that the purdah/veil system does not create any problem in getting jobs in the country. A vast majority of the respondents view that the purdah system does affect getting a job. Jannatul Ferdous Shuma (26) views that wearing purdah is quite a personal matter and it does not affect in getting jobs for women. In contrast, Shahina (23) replied that it often creates problems for women, as it is computed to be a barrier in getting jobs. She argued that women who wear purdah are generally seen as traditional women and are very often neglected by the so-called modern employers to offer jobs. Broadly, women who wear purdah are mostly rejected to offer jobs in many jobs sectors namely, sales and marketing, customer care and corporate areas. Most of the respondents view that the veil system does not create much problem for getting a job in modern society. Very few job sectors assess it to be an outdated old-fashioned ritual. Although religious and cultural factors work, in a broad sense, women do not think purdah or veil system is an obstacle to get jobs; rather many view that it is solely a personal choice.

6.2.2 Employment opportunity needed for the rural women in Bangladesh

The workplace also holds great importance in society as employment greatly contributes to economic growth. Development-workers produce valuable goods and services, offer care and social services. In turn, they receive a wage or salary which they can spend on buying living materials and goods that helps to accomplish a healthy and prosperous life. Getting an employment opportunity enhances skills for the workers and makes them self-reliant. Women who work outside the families are self-reliant and able to make decisions independently. Jobs can truly help and strengthen women in various ways. First, women who work help them in making decisions independently in families or outside of the families. Therefore, their confidence grows, they become self-independent. They do not need to ask others for the economic help they need, as a result, the purchasing power for women increases gradually. Also with their earnings women support their families which is very important for a happy life. Such earnings even help families to get rid of poverty. Sheikh Sultana (33) views that a woman, who has a job outside the family, does not need to ask for money from others. Consequently, it creates women's decision-making power. Nahar Begum (27) says that a job therefore creates a solvency for women and she can fulfill the demands of their family. She added that employment is important for his life. For example, as she puts it, employment ensures

daily decent meals, a place to stay and other things such as clothes, security, medications, etc. even an employed woman can provide good quality education to her children. Many other respondents view that employment is not only important for a person's well-being but also often boosts a person's moral integrity, especially for a woman. It also gives women self-confidence especially when social interaction with other people. This is to say the income thus helps not only the women who earn but also the families as a whole.

6.2.3 People's perception towards the women who work in rural areas of Bangladesh

Nowadays, Bangladesh is positively thinking about the status of women employment. Women, especially those who work outside and earn money for their families are respected and honored. Bangladesh has the patriarchal social structure that views the father as the bread earner of the families and the mother as the actors for keeping household activities. Generally, women in patriarchal society are not encouraged to work outside of the family. However, presently, the social ethos and economic condition has changed in Bangladesh and the women are encouraged to work outside of the families. Nazma Sharmin, a younger and unmarried girl of age 17, narrated that doing a job by a woman is seen positively by the people and most of the people in society currently want women to work outside of the family.. This is because working women can help themselves, their families, as well as the society and the country. Most of the respondents opined that an employed woman is an asset to her family and for the society. They can generate income to the institutions they work and in return, the institution pays taxes to its government thus generating income for the country that will be used for the welfare and the benefits of the people such as road works and infrastructures or to support government related projects such as housing, education and health etc. This judgment sharply contrasts with the rural people who think that women should not work outside of the home as it is harmful for the honor and integrity of the families. They view that women should work inside the families for the children and other members. It is a religious and social ethos for a woman to prepare foods and nurture children inside the families. Many also view that religious superstitions hinder keeping women from being employed.

6.2.4 Better employment opportunity for the women ensures income-generating activities in Bangladesh

Income generates income. Creating a job opportunity opens up the window that initiates income generating activities. Respondents view that working women can spend money for income-generating initiatives and they can help other women to invest and generate money. Many view that in most of the cases the earning of a woman is generally used to support the family needs and demands. Nazma Sharmin (17) opined that working women spend their salary independently. For example, she said that working women in rural areas can use and invest their salaries in poultry farms, agro-based small industry and livestock activities. On the other hand, many view that women usually get a low salary

and because of it they could not create any fund for further investment in income generating activities. Most of their earnings are used to fulfill their familial needs and demands.

6.2.5 Better employment of the women ensure healthcare security for rural women in Bangladesh

Employment opportunities are essential to restore productive capacity and economic independence of women who work and earn money. Better employment contributes to getting autonomy for women, pursuing a better quality of life, overcoming the vulnerabilities and negative effects in health. It brings working women in keeping healthy and prosperous life to them, their family and to the society. Interviewees view that better employment can help women to ensure their healthcare security. The women can make medical and healthcare decisions independently. Many view that as working women do not solely depend on the income of other family members, they may use their earnings in their healthcare purposes. Sheikh Sultana (33) views that working women who live in an educated and culturally flourished developed families may use their earnings as their wishes. But the tendency of many families is that the male wants to spend women's income without their permission.

6.2.6 Better employment of the women ensure making choice of voting in election independently in Bangladesh

Citizens voting choices are determined by their employment status. Economically solvent and educated women can make free choice to vote according to their wish. Many view that an employed woman can vote independently in election as the job allows her to make free decisions and be self-dependent. Fatema Khatun (37) expressed her view in a way that an employed woman is more aware of their rights compared to unemployed women. An employed woman can make free choice in making decisions in families and the outsides. Many respondents view that although working women are free from family pressure in making free choice to vote anyone in elections, sometimes husbands tend to control the voting choice of wives. Many other respondents view that better employment opportunities ensure women's right to make free choices in giving votes in elections. Working women do not even face any obstacles and pressures from families and other relatives.

6.2.7 Barriers to rural women in getting leadership positions in politics in rural Bangladesh

Culturally and traditionally, Bangladesh is a patriarchal society in which men dominate women. In such a society, women face various obstacles while taking political leadership, especially in rural areas. Most of the respondents view that religious superstitions and lack of economic solvency hinder rural women to be empowered politically. Sheikh Sultana (33) views that women are discouraged to hold political power by the male

counterparts as they view that politics is the place for men and women should work for the families and household activities. According to Aklima Khatun (52), women have to stay at home most of the time for household activities; they should not be allowed to be involved in politics. She also views that as women are not physically capable of carrying out the duties and responsibilities, they should be refrained from politics in the context of Bangladesh. However, as the socio-economic structure of the country is gradually changing, the perception of the common people are also changing and women are encouraged to lead the society. Most of the respondents view that educated and self-reliant women hold political power and lead the society currently.

6.2.8 Better employment of the women contribute to greater decision-making power in the family and society

Economic solvency empowers women and creates opportunities to take part in the decision making process. Respondents view that economically empowered women are self-driven and self-dependent and it enhances and contributes to making decisions. Sheikh Sultana (33) opined that as working women can contribute to the socioeconomic development of both families and of the society, they should have rights to take part in the decision making process. Even educated and economically solvent women can make appropriate and right decisions for the families and the society as well. However, many other respondents view that women are still neglected and discouraged in making decisions by the men even if they are capable of doing so. Aklima Khatun (52) views that our patriarchal and male dominated society does not think that good employment status of a woman necessarily ensures decision-making power for women. This inferior status of women, she believes, is biological, and all should accept this natural limitation of women.

6.2.9 Reasons behind the women unemployment in rural Bangladesh

Women constitute nearly half of the total population in Bangladesh and their economic participation has increased significantly. The number of working women gradually increased to 18.6 million in 2016-17 from 16.2 million in 2010. However, women face obstacles to get jobs. Sheikh Sultana (33) views that illiteracy, familial crisis, male dominance societal structure, lack of education and awareness, higher rate of child marriage, and religious and cultural superstitions are the building blocks for not getting jobs for women in the country. She also opines that the narrowly focused social outlook, lack of good working environment and lack of proper training are equally responsible for a woman not being employed in Bangladesh. Many other respondents said that poverty does not hinder to create job opportunities for women in the country. Many also view that society does not see women as workers rather they should be at home for household activities. Even husbands often do not allow wives to work outside the family and they think that allowing women to work outside is a kind of curse of a family.

6.2.10 Increasing women employment opportunities in rural areas of Bangladesh

Bangladesh is one of the fastest growing economies in the world. The averaged GDP growth of the country is 7% that has been largely driven by its exports of readymade

garments, remittances and the domestic agricultural sector. The workforce, especially women, works in the readymade garments sector. Most of the respondents view that the government should properly utilize its workforce by establishing garment industries and people who have been working in this sector should be provided proper training that may create more job opportunities in the country. Along with this, the government should also encourage private owners to establish handicraft, small farms in private sectors and should provide them training and financial support. It may result in promoting and allowing rural women to work at home which will help people to get financially developed themselves and the country too. On the other hand, as people hold different qualifications and skills, Shahina (23) said that the government may also create different and decent job opportunities for the people who hold higher qualifications and skills.

7. Conclusion

This study concludes that better employment opportunities are closely linked with human development issues such as health and education. The study finds that women who work outside the families are more likely to have free choices to make voting decisions in elections and are self-dependent and self-reliant. The paper revealed that working women are capable of taking care of others that builds cohesion and strengthens bounds within families and communities. For example, working women are capable of providing social care and financial support for the families. The research has discovered that employment opportunities allow women to participate fully in society for their families while affording them a sense of dignity and worth. Finally, the study recommends that the government of Bangladesh should create more job opportunities for women that will ensure welfare for the citizens and foster Bangladesh as a prosperous country.

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Socioeconomic Status and Abuse of Elderly in Rural Bangladesh

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Submission: 29-10-2020
Acceptance: 28-02-2022

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Abstract: *Nowadays, elderly abuse is a grave concern. It has been increasing fast worldwide with no exception in developing countries like Bangladesh. There are a number of reasons for such abuse. This study particularly is an attempt to examine the relationship/linkage between socioeconomic status (SES) and abuse of the elderly in rural areas of Bangladesh. This paper was conducted in 2019 and data were collected from rural areas of the different districts in Bangladesh and 120 respondents (conveniently male 70 and 50 female) are selected from 1125 elderly population using Krejcie and Morgan formula. A simple binary logistic regression model has been tested depending on age, education, and marital status. The paper divulges that there is a strong relationship between socioeconomic status regarding age, education, marital status, and elderly abuse. It further shows that elderly, particularly widow, widower, divorced, elderly 70 and above years and illiterate including those who can sign only are abused more. The findings of the paper would be significant guidelines for the policymakers, education and development practitioners, community development and youth welfare workers, social scientists, and human rights workers.*

Keywords: Abuse, Bangladesh, Elderly people, Socioeconomic status, Neglect

1. Introduction

The elderly population is growing at an annual rate of 2.6 percent worldwide, much faster than the annual population growth rate of 1.2 per cent. The proportion of the elderly has increased progressively from 8 percent in 1950 to 11 percent in 2009, and is expected to reach 22 per cent in 2050 (United Nations, 2009). Likewise, Bangladesh is not an exception to this process of population aging. The latest Population Census of Bangladesh (2011) demonstrated that Bangladesh has a population of about 150 million people, and 7.4% of its population is elderly. This percentage of the elderly population is projected to be 8.0% in 2020, 11.9% in 2035 and it will be an aging nation when it reaches 17.0% in 2050.

Elderly abuse is also called elderly mistreatment or elder mistreatment. Elder abuse is defined as a knowing, intentional, or negligent act to a vulnerable adult. Laws to protect and prosecute the elderly may vary from place to place (Siddika, 2015; Islam, 2015). Elderly abuse encompasses two broad categories i.e abuse and neglect. Abuse is a positive act, commonly an act of commission, and there is active involvement or interaction on the part of the abuser (James, 1994; Islam, 2015). In Bangladesh, along with the growth of the senior population, elder abuse is also increasing tremendously. The increasing elderly population is a significant contributory factor to escalating elder abuse. Elder abuse is growing into a national crisis. There has been the quick destruction of norms and values in society along with the demographic transformation. De facto lack of awareness, legislation, and enforcement of law; elderly abuses have been growing at

every level of society. Elder abuse is a "silent condition", as no one knows exactly how many of our nation's elderly are being exploited, neglected, or abused. Evidence suggests that there are thousands of elderly people being harmed every day, but no official statistics exist. It has been remaining as a private matter, hidden from public view (The Daily Sun, 2018). Abuse and neglect of the elderly is no longer isolated family violence, but rather it is recognized as a human and civil rights issue and a global public health concern (Farid, 2017). The World Health Organization (2002) estimates that 1 out of 10 older people experience abuse each month. Despite having serious and devastating consequences on the elderly and society, the issue remains as undefined, mostly understated, and ignored by societies across the world. Bangladesh is an agriculture-based rural society characterized by overpopulation, massive illiteracy, poor health, natural disasters, low agricultural productivity, undeveloped industrial base, severe unemployment, etc. which are creating severe poverty, changing their values, and fragmented their family. This changing situation may invoke more elder abuse and negligence (Samad, 2002). Furthermore, in Bangladesh nuclear families are increasing day by day leaving older people alone separately which results in their vulnerability. Besides, due to the lack of well-furnished welfare services and adequate elderly support systems, they are likely to be abused in various ways (Bariker et al., 2016). Adults grow older, they may become more physically frail, may not see or hear as well as they used to, and may develop cognitive problems such as dementia. As a result, they become increasingly vulnerable to abuse and neglect (Zohra et al., 2013). Elder abuse is also regarded as domestic violence. In Bangladesh, the Domestic Violence (Prevention and Protection) Act, 2010 recognizes violence toward older persons and defines it as a breakdown in social relations between an older person and his or her family. The law enforcement agencies especially 'the police' seldom regard domestic violence as a crime; rather they always perceive such violence like elderly abuse as part and parcel of the culture and society. Although the government has enacted the Act, the application of this Act is not strongly visible in society (Biplob, 2012; Jamaluddin et al., 2014). Elderly abuse and negligence spread its roots everywhere in Bangladesh, found tremendously in rural areas. About 80% of the elder live in rural areas. Their sufferings are the cumulative effects of a lifetime (The Daily star, 2015). In the present circumstances, older persons are vulnerable to abuse, neglect, and exploitation (Datta, 2006; Munsur et al., 2010). In the meantime, several studies have been conducted on different elderly issues in Bangladesh including their vulnerability, neglect, and many other root causes of elderly abuse (Begum, 2019; Tareque et al., 2014; Islam, 2015; Rahman et al., 2010). But there is hardly any study that has attempted to establish the association between socioeconomic status and elderly abuse exclusively. However, this paper investigates the relationship between socioeconomic status and abuse of elderly, quantifies the extent of elderly abuse in rural Bangladesh and expands the literature horizon of the gerontological field as well.

2. Objectives of the Study

- a. To know the socio-economic background of rural elderly;
- b. To examine the relationship between socio-economic status and abuse of elderly;

- c. To explore the extent of abuse in terms of the socio-economic background of rural elderly.

3. Hypothesis

There is a relationship between socio-economic status and elderly abuse. The relationship is positive. The higher the socio-economic status of the elderly the less they face abuse. It is also assumed that lower socio-economic status tends to increase the abuse of the elderly.

4. Literature Review

Through a heuristic document search, this study reviews a significant number of major academic articles on elderly abuse in Bangladesh. The articles are categorized into four broad domains: i) forms of elderly abuse, ii) quality of life of the elderly population, the distribution of wealth and elder abuse, iii) the causes and determinants of elderly abuse, and iv) strategies in the prevention or reduction of elderly abuse in Bangladesh and Malaysia. This literature review is intended to identify the major gaps in the existing academic literature in order to design effective interventions for the critical problem of elderly abuse in Bangladesh. In the literature particularly no study is found on the relation between socioeconomic status and abuse of elderly in Bangladesh. It is hopeful that this study will be able to find a linkage between socioeconomic status and abuse of elderly and provide a guideline to those who are working with the elderly and enrich the horizon of knowledge about gerontology. As the senior population is increasing in Bangladesh, elder abuse is also increasing profusely. A lot of studies have been published so far on different issues of elderly and elderly abuse around the world, even in Bangladesh. Remarkable studies are reviewed below.

Begum (2019) published an article on issues of elderly abuse and their vulnerability among older women in Bangladesh. She identified that older women were the worst victim of elderly abuse, which had a consequential impact on older women's life and mental health. She argued, social awareness, and governmental and institutional support are considered key measures to address those issues.

Tareque et al. (2014) published an article on economic well-being and elderly abuse in Rajshahi district of Bangladesh. They examined the distribution of wealth and then tested associations between elder abuse and wealth in Rajshahi district of Bangladesh. They found that about 62% of individuals from poor households were facing abuse of some kind, compared to only 6% of individuals from rich households. The test of the relationship between elderly abuse and wealth also suggested that individuals from rich households were less likely to be abused than individuals from poor households.

Islam (2015) published an article on the abuse and neglect of the elderly from Bangladesh perspectives. He found that the incidence of abuse and neglect of the elderly was all-encompassing and it was more in the rural areas and among the females. He also found that among the abuses, physical and mental abuse including various forms of neglect, unmet needs and misbehavior were predominant. He also demonstrated that both abuse and negligence were higher in rural than urban areas and women experienced more abuse than male irrespective of residence. He recommended that at the family level

members of the families with the elderly should be oriented to the dignity of the elderly, and at the state level organized old age homes should be established throughout the country, particularly for female elderly in rural areas.

Jamaluddin et al. (2014) highlighted the strategies for the prevention or reduction of elderly abuse in Bangladesh and Malaysia. They examined the issue of elder abuse and the strategies undertaken by both countries to overcome the issue. They opined that in both countries, there must be continuous focused efforts on educating and creating awareness of elderly persons' needs within the larger society. Formal, non-formal, as well as informal methods of public education, must be adopted to increase public awareness. All these measures are required on a national scale to effectively ensure that strategies and efforts are put in place for the protection and wellbeing of the elderly.

Rahman et al. (2010) conducted a study on the causes and determinants of elderly abuse in seven villages of the Naogaon district of Bangladesh using PPS sampling technique. They found that poverty was the most dominant factor responsible for elderly abuse. Elderly people, as evident in the study, used to experience all kinds of abuses whereas mental and economic abuses were of prominence.

Munsur et al. (2010) conducted a study on determinants of living arrangements, health status, and abuse among elderly women in rural Naogaon District, Bangladesh. They found that the majority of the elderly women in the age group of 60-69 years were widowed, illiterate, have no education and income, economically dependent, living with married children, unhealthy, suffering from arthritis-related illness, and are taking treatment from village doctors. They also found that roughly 35 percent of elderly women were abused, mostly mentally abused due to poverty. They used logistic regression analysis which revealed the determinants of living arrangements, health status, and abuse of elderly women. They finally suggested that the elderly, especially the female elderly of Bangladesh and also of developing nations, should get due attention to have the provision for a secure future.

Farid (2017) focused on elderly abuse and their negligence in Bangladesh and attempted to find factors and impacts of this malpractice employing a qualitative approach. He found that financial and physical abuse were more frequent among poor and weaker sections, whereas psychological abuse appeared as severe among those belonging to the middle and affluent classes. He further found that families having strong religious practices and a long tradition of taking care of the elderly were less subjected to elder mistreatment. As is revealed, along with various other factors, degradation of moral and religious values, new family structure and the lower socio-economic status of old people were associated with the maltreatment they faced. He recommended that socio-economic insecurity and a poor institutional mechanism for old persons caused a higher incidence of elder abuse and neglect in Bangladesh, which requires immediate action from all levels.

Chen et al. (1982) conducted a pilot study on elderly abuse in domestic settings in the Boston area in America. The study encompassed three phases: (1) interviews with

experts. (2) a survey to build a sampling frame by ruling out inappropriate contacts. (3) a cross-section survey of 90 practitioners who had contacts or knowledge about elderly abuse. The thirty questionnaires which were returned from represented various social, medical, homemaker, and legal services agencies. He revealed multiple causations, symptoms and effects of elderly abuse and indicated that the public at large was unaware of and unconcerned about the elderly victims of abuse. He also found that current methods and skills of intervention were inadequate and community resources were inadequate for both the abused and the abusers. He is optimistic that this study will stimulate interest and set some priorities in addressing the problem of elderly abuse.

Chalise (2018) published a review article on elderly abuse as a neglected issue in developing countries. He found that the abuse of the elderly had an impact on the health and well-being of elders and could lead to increased health care costs nationwide. He proposed that international and state organizations as well as every member of society should take action to solve the hidden elder abuse issue through comprehensive research so that the elderly can enjoy their remaining years.

Employing a quantitative approach, Chalise & Basnet (2017) published an article on the abuse of older adults residing in the community of Nepal. They found that 95% of older persons heard about abuse of older persons and the prevalence of abuse was 47.4% in the last six months. The most common older person's abuse was neglect (35.4%), followed by showing disrespect (34.8%), verbal abuse (25.3%), economic abuse (8.1%) physical abuse (5.7%), and emotional abuse (5.1%). They further found that older men were more suffering from abuse compared to women, the literate had higher abuse and the elderly suffering from the disease had higher elder abuse.

Mudiare (2013) published an article on elderly abuse in the Nigerian context. He explained elder abuse from the global and historical perspective, identifying the various forms of abuse, their prevention and intervention strategies, societal norms to confront it, the roles of individuals, family, society, and government, and teaching the rights of the older person in addition to elucidating on where to go when seeking redress. His effort is to create awareness and sensitize the individual, family, society, and government about the problems and consequences of continued, unabated gross abuse of our senior citizens as they live in silence and ignorance of their rights.

Using a qualitative phenomenological method, Buzgova & Ivaova (2009) described employees' and clients' lived experiences of elder abuse. Using snowball sampling, 26 employees and 20 residents were selected from four homes for elderly people in the town of Ostrava, Czech Republic, and two managers were chosen from outside these institutions. All complaints about elder abuse (n 5 11) received by Ostrava Municipal Authority during the period 2003 to 2007 were examined. Two main dimensions of the examined phenomenon were identified: forms of elder abuse and causes of elder abuse. Established forms of elder abuse were summarized as rights violation, financial abuse, psychological abuse, physical abuse, and neglect. Causes of elder abuse included institution, employee, and client characteristics. The study implied that it is necessary for residential settings to create preventive policies that will focus on supervision regarding

elderly people's rights violation and psychological and physical abuse, as well as on building organizational cultures that will respect ethical principles.

Anand (2016) published an article on the role of socioeconomic factors in the abuse and neglect of the elderly population in Maharashtra, India using a quantitative approach. He found that around 35% of the elderly in Maharashtra faced abuse of any kind. The percentage of elderly who faced verbal abuse (30.1%) was highest, followed by economic abuse (22.5%) and physical abuse (18.0%). Neighbors (56.1%), sons (43.1%), relatives (38.6%), and daughters-in-law (31.9%) were involved in the majority of the abuse cases. Education, wealth quintile, living alone, and the presence of any disability and morbidity or injury were the important determinants of elder abuse. He recommended forming policies and strategies to prevent abuse of the elderly population in Maharashtra.

Chaurasia & Srivastva (2020) published an article on abuse, neglect, and disrespect against older adults in India to find out the prevalence of elder abuse and the study also tried to examine the differences in elder abuse cases by several socioeconomic characteristics, chronic conditions, etc. They found that overall 11% had reported any type of elder abuse, while verbal abuse reporting was highest (90%) followed by disrespect (52.5%) and neglect (45.21%) respectively. Physical violence was high among males while 61% of women were being neglected in society. In rural areas, approximately 80% of the elderly were facing different types of abuse. They revealed that the most common perpetrators of violence within and outside the family were verbal abuse (66.34% within the family) and physical abuse (45% outside the family). Thus, it indicates that elderly women, especially widows, those in the oldest-old age group (80+ years) and physically immobile, were more vulnerable to abuse than others. Education, wealth quintile, living alone, and the presence of any morbidity were the important determinants of elder abuse. Not only the poor, but even the rich were also susceptible to neglect and abuse in many families. They argued that the government must realize its rationality and need to bring the needful policies or programs in the care of the elderly.

Over the years, the problem of elderly abuse has not only increased but taken newer and more morbid forms and shapes in Bangladesh. It is found that a lot of studies have been published but the literature reviewed above have failed to provide an accurate relationship between socioeconomic condition and elderly abuse. It is expected that by showing a strong association between the underlying factors and elderly abuse, the current study will be helpful to encounter the emerging problems of the elderly in Bangladesh.

5. Conceptual and Theoretical Framework

Abuse is a parallel word of misuse, mistreatment, ill-treat and maltreat. It as a noun refers to improper use, handling, giving physical maltreatment, using unjust or wrongful practices, insulting and using coarse language(Rahman et al.2010) . Elder abuse has two connotations: abuse and neglect. Abuse is an active and explicit act, commonly an act of commission, and there is active involvement or interaction on the part of the abuser (James, 1994). On the other hand, Neglect is used to describe acts of omission,

specifically those with a passive and implicit involvement of the abuser (McCullum, 1993). There is a relation between 'socioeconomic status' and 'elderly abuse'. The higher the socio-economic condition of the elderly, the better their livelihood, and the lower socio-economic condition is likely to face elderly abuse. In this study 'socioeconomic status' is an independent variable and measured by (age, gender, education, employment status, marital status) and 'elderly abuse' is the dependent variable. It is also a qualitative variable and will be of two categories 'abused' or, and 'not abused'. So the conceptualization of elderly abuse consists of two categories which are potentially associated with the socioeconomic status of the elderly in Bangladesh.

The present study mainly incorporates feminist theory, exchange theory, and stratification theory in explaining elderly abuse. The exchange theory reveals the fact that a lack of exchange relations within the family leads to elder abuse and neglect. As age increases people lose their power in their families due to lack of jobs and income. This theory shows that powerlessness leads to a decrease in the contributing capacity of aged persons. Physical and economic contributions on the part of the elderly are deteriorating within the family. Consequently they gradually become dependent on the family members for their day-to-day activities and economic needs. All the above-mentioned factors result in poor exchange relations in the family and give rise to elder abuse and neglect within the family. From this, it is perceptible that the contributions of the elderly in the exchange relations of the family lead to the increasing mistreatment towards elderly by other members in the family. This shows an interconnection between the contributions of elderly people and mistreatment towards them in the family. On the other hand, feminist theory focuses on spousal elder abuse as a significant dimension. According to this theory, older women are more vulnerable to spousal abuse as they tend to have less power than men. Moreover, men have more social and financial resources and they regard women as their property.

According to stratification theory, jobs as caregivers, though badly needed for the survival of the elderly, are perceived at the bottom of the stratified system and thereby are not desirable due to low status and poor pay. Caregivers for the elderly receive low pay, and their job title has little prestige, regardless of where the job is done. It can be expected that elderly abuse occurs when the caregiver tries to control the older person. When the caregiver overrides the elder's wishes, which might be influenced by dementia, the elderly person may resist the caregiver. With little status, the caregiver may feel the need to gain control over the elder. Within the stratification theory, it can be assumed that a caregiver's low job satisfaction and low levels of education may contribute to elder abuse. Both exchange theory and stratification theory have been considered in this present study to examine the relationship between socio-economic status and elderly abuse in rural Bangladesh.

6. Methodology

A cross-sectional non-experimental design was followed for this research. Quantitative method was used in this study. The study was conducted on purposively selected six

districts (Chapainawabganj, Faridpur, Gaibandha, Kishorganj, Mymensingh & Pabna) of Bangladesh. In this paper, the elderly, who are at the age of 60 and above, have been considered as a unit of study. There are two types of variables: socioeconomic status as the independent variable and elderly abuse as the dependent variable. Socioeconomic status has been measured by five indicators that include gender, age, education, marital status, and income involvement at present. Elderly abuse has been measured by two indicators whether they face abuse or not i.e. yes or no. The interviewees (rural elderly people) were the source of data. Data were collected through a survey from 120 respondents (conveniently 70 males and 50 females were selected from 1125 elderly using the sample frame) who have been taken as a sample as per using Krejcie and Morgan formula of determining sample size. A semi-structured interview schedule was generally used for collecting quantitative data. Both descriptive and inferential statistics have been applied for analysis using SPSS 20 version software. Secondary data (particularly journals, published and unpublished books, and websites) have also been consulted to analyze the relationship between two variables and find symmetries of findings between present and previous studies. All types of ethical considerations (especially the objective of the study was clearly explained to participants and participation was voluntary, informed verbal consent was obtained prior to data collection) have been strictly maintained. Both bivariate and multivariate analyses have been carried out. Firstly, whether the elderly being abused or not has been examined across some parameters related to socio-economic characteristics of the elderly (i.e. gender, age, education, marital status, income involvement at present) through cross tabular analysis. Besides, logistic regression analysis has been applied to know the extent of relation between two observing variables where dependent variables (elderly faced abuse or not) are dichotomous in nature. Logistic regression can be used not only to identify the risk factor but also to predict the probability of success.

7. Results and Discussions

Table 7.1 A Bivariate Analysis of Variation in Elderly Abuse

Variables	Categories	Elderly abuse		P-value
		Yes	No	
Gender of elderly	Male	62.9	37.1	0.751
	Female	60.0	40.0	
Age of elderly	60-65	62.7	37.3	0.072*
	66-70	51.1	48.9	
	Above 70	79.1	20.8	
Education of elderly	Illiterate	71.0	29.0	0.017**
	Only signature	61.8	38.2	
	Literate	37.5	62.5	
Marital status	Married	55.4	44.6	0.011**
	Others	82.1	17.9	
Income involvement at present	Yes	59.1	40.9	0.659
	No	63.2	36.8	

*P < 0.10; **P < 0.05; ***P < 0.01

Others: divorced, widow, widower

Based on bivariate analysis it is evident in the above Table that gender is not a statistically significant variable which indicates that both male and female elderly experience abuse irrespective of gender. Male elderly (62.9) are abused to some extent more than female elderly (60.0) in rural areas . However, unlike gender, the variable 'age' is found statistically significant. The study finds, that elderly people of every age group experience abuse. Surprisingly, the more the age increases, the more they experience abuse as it is clearly evident that 79.2% elderly of the age group of 70 and above experience abuse compared to 62.7% elderly belonging to the age group of 60-65 and 51.1% of elderly belonging to the age group of 66-70. In respect to education, Illiterate elderly (71.0) and only can give signature (61.8) experience more abuses than literate elderly (37.5) and it is statistically significant. Table 7.1 also demonstrates that married elderly (55.4) face less abuse compared to divorced, widow, widower elderly (82.1) and thereby the variable 'marital status' is also found statistically significant.

In bivariate analysis of variation of elderly abuse, income is not found statistically significant. However, it is mentionable that those who have no involvement with income face abuses more than those who are involved with income and the percentages are 63.2 and 59.1 respectively. This indicates that the elderly who are not in a position to work at the last stage of life, have to work hard to survive their remaining life. By and large, it is obvious from the Table that age, education, and marital status have an effect on elderly abuse which are statistically significant.

Table 7. 2 A Multivariate Analysis of Variation in Elderly Abuse

Variables		Elderly Abuse		
		Coeff.B	S.E. of Coeff. B	Odds Ratio
Age of Elderly	60-65(ref)	-	-	1.00
	66-70	-0.382	0.440	0.68
	Above 70	0.658	0.600	1.93
Education of Elderly	Illiterate(ref)	-	-	1.00
	Only signature	-0.054	0.482	0.95
	Literate	-0.958	0.538	0.38*
Marital Status	Others (ref)	-	-	1.00
	Married	-1.022	0.567	0.36*
Constant		1.552	0.551	4.72***

*P < 0.10; **P < 0.05; ***P < 0.01

Results based on the multivariate logistic regression analysis for elderly abuse are shown in Table 7.2. Before performing multivariate logistic regression analysis, all the

significant variables in the bivariate analysis are included in the model. Results show that the elderly of the age group 66-70 suffers from abuse less than the age group 60-65. As the age increases, the elderly who are in the age group 70 and above are likely to face abuse 1.93 times as compared with the reference category. Abuse is also strongly related to the level of education. It is apparent from Table 7.2 that literate elderly face less abuse than the 'illiterate' group and 'only can give signature' group of the elderly and illiterate elderly abuses prominently which supports the study of Rahman et al. (2010) though contrasts the findings of the study Chalise & Basnet (2017) due to cultural variation of that country.

Respondents' marital status also exerts a significant effect on the abuse of the elderly population. Again, it is obvious from the Table that married elderly are abused less compared to widowed, widower, and divorced. Thus, the study strongly argues that the elderly who are widowed, widower, and divorced experience more abuse than married elderly which is supported by the findings of Munsur et al. (2010).

8. Conclusion

The elderly is a serious reality and the last step of the life cycle of a human being where more care and attention is obligatory. It is an inevitable and irreversible period that everybody undergoes. One should keep in mind that old is gold and they are an everlasting and invaluable asset of family. They can employ their knowledge, wisdom and skills not only for the betterment of themselves but also for the family and society. So, no one should disregard their capability. Abuse of the elderly is a menacing problem and increasingly being felt by many people can hardly be defined (Rahman et al., 2010). The previous papers revealed that the most vulnerable section of the elderly belongs to the oldest age group due to their disability and debilitating conditions, yet the elderly of younger age groups who are relatively active but have no means to survive cannot also be overlooked. Also, financially well-off families can accommodate their dependent parents better compared to the poor classes due to the economic hardship of the children (Thane, 2000). In this paper, an attempt was made to observe the effect of the socio-economic status condition on the abuse of the elderly. The findings of the paper broadly suggest that illiterate, only can sign only, divorced, widow and widower, who are dependent on others face immensely elderly abuse. Both Bivariate and Logistic Regression Analysis show a strong association between socioeconomic status of the elderly and the abuse they experience. Multivariate analysis shows that respondents' educations, marital status are significantly responsible for the abuse of the elderly. The findings also show a close relationship between age, education, marital status, and the elderly abuse. However, the study has failed to focus on the cultural effects of elderly abuse. A separate and comprehensive paper is therefore necessary to explore the sociocultural effects on the elderly abuse. Despite the limitation, the overall findings would be a significant guideline for the policymakers, education and development practitioners, community development and youth welfare workers, social scientists, and human rights workers, to formulate aging-friendly policies for the betterment of the elderly who are experiencing wretched life in rural Bangladesh.

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Social Media and Public Opinion Formation: A Study on "No-Vat Movement (2015)" of Private University Students in Bangladesh

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Submission: 15-03-2021
Acceptance: 28-02-2022

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Abstract: *Due to the digitalization of the whole world, researchers attempt to study the role of social media in the formation of public opinion. The objective of the study is to explore the role of social media on public opinion formation in Bangladesh. This study aims to identify the information level of the individual, their values, social class, self-interest, or ego-involvement as a factor in public opinion formation. The present study used a mixed methodology based on survey and content analysis as data collection techniques. The total number of respondents for the survey is 100 and the study areas are different private universities in Bangladesh. The survey was conducted in February 2017. The data for content analysis was collected from comments, status, and shares during the time of movement from Facebook, Twitter, and Youtube. Noelle-Neumann's (1993) spiral of silence theory is used to explain the nature of public opinion formation through social media activities. Existing literature shows two opposite groups on whether social media play a significant role in public opinion formation. The study found that although social media played a significant role in public opinion formation, mass media and other factors (e.g., government support) played a significant role in forming public opinion and organizing the movements. The study also found that social media has been used as a platform for overcoming some obstacles to expressing alternative views, which was impossible in other ways.*

Keywords: No-VAT on Education Movement, Public Opinion Formation, Social Media, Social Movement

1. Introduction

Since 1996, the operation of Internet service in Bangladesh has been started and created diverse opportunities for political, cultural, and rational discussions. Recently the emergence of Bengali or Bangladeshi blogging communities is highly observed. Bangladeshi blogs have become a very popular version for internet users who want to take part in different types of political or socio-cultural discussions (Haque, 2011). The nature of social media use in Bangladesh becomes evident but the mechanism of how the media plays a role to social movement is still not scientifically investigated. An important social movement-No VAT on Education (2015)- happened in the capital city of Bangladesh where social media were also used. In 2015, private university students protested against the imposed VAT on Education in Dhaka city. The then Finance Minister of Bangladesh government first introduced a 10% VAT on higher education in private universities in the draft of the budget of 2015-16. Following strong opposition, the VAT was reduced to 7.5%. On 9 September, 'police opened fire' on a protest by the

students of East West University. This caused major support by other private university students. On 10 September, road blockades were carried out by students from different private universities to protest the VAT on tuition fees. After the protest of the next couple of days, the imposed VAT was withdrawn by the finance division after a cabinet meeting on 14 September 2015. In this protest, students used social media to organize different private university students under a common demand. Therefore, this study took No-VAT on Education Movement as a case to understand and compare the role of social media in public opinion formation.

Young's (1956: 338) argument "the media of public opinion formation are important" has encouraged us to examine the role of social media in public opinion formation. But can the importance of social media be examined in this regard? Critical judgments have been divided on this issue. Shirky (2011: 32) admits that social media are "long-term tools that can strengthen civil society and the public sphere" and have positive effects on democracy. On the other hand, Fuchs (2013) argued that there is a limitation on freedom of speech and public opinion on social media: individuals are not similar in case of formal education, knowledge, consciousness, or material resources for participating in public activities (Habermas, 1989: 227), and asked, "Can meaningful political debates be based on 140-character short messages?" But can the same question be asked for Facebook? Facebook has the option to share long messages. Do different types of social media (i.e. Facebook, Twitter) have different roles in public opinion formation? Morozov (2010) also questioned the "Twitter revolution" and believed that it is based on cyber-utopianism. The researchers have attempted to find out the answers to these critical questions.

This study expects that social media is supposed to have an important role to form public opinion in Bangladesh. Information, knowledge, and level of enlightenment are important factors in public opinion formation. Social media has a different role in different situations and the degree of the role is also varied by different contexts. Mass media reported that they were gathered by social media. This study will analyze the real factors of the No Vat Movement and the degree of social media's role in it. This proposed study will also unmask the supreme capacity of social media to achieve the vision of 'Digital Bangladesh'. This study will help to develop social policies related to national internet and communication technology.

The goal of this study is to create new knowledge about social media's role in public opinion formation in Bangladesh and enhance academic research in this area. The main objectives are (1) to explore the nature of public opinion formation and the varied role of social media in "No-Vat Movement (2015); (2) to examine the information level of the individual, their values, social class, self-interest or ego-involvement as a factor to the public opinion formation; and (3) to explore the degree of social media's role on public opinion formation.

2. Literature Review

The origin of the conception of public opinion can be drawn back to the writings of the nineteenth-century French social psychologist Gabriel Tarde, who identified interpersonal exchange and the formation of a network of opinion (Tarde, 1969).

Durkheim's analysis of "collective conscience" also provides a widely known vision of the possibility of public opinion, yet it is largely limited to pre-modern societies (Durkheim, 1933). Stephens (1979:71) argued that public opinion reflects class consciousness, which is, in turn, a product of social forces, one of which is the level of labor organization. Public opinion may be viewed as a personal and behaviorist event; it has little significance in the movement-oriented program (Manza and Brooks, 2012:90). Eugene L. Hartley (1950-51:669) claims that public opinions and attitudes on social issues are group products. The opinion of an individual is a function of his group affiliations. "Social Media is a group of Internet-based applications that is based on the ideological and technological foundations of Web 2.0. It permits the creation and exchange of User Formed Content" (Kaplan and Haenlein, 2010:61). Kaplan and Haenlein (2010) identified six types of social media. First, a collaborative project is the most independent creation of user-generated content by which users easily generate, manage, and check over the content. The well-known examples are the free online encyclopedia, Wikipedia. Second, blogs and microblogs are the forerunners of social media. Most blogs are text-based, but today other versions of communication like audio, video, and images are used. The third is the content communities like YouTube for videos or Flickr for photos. The main goal of users is to devour and contribute to the content. Fourth, is social network services. These services (e.g., Facebook) present their users with a variety of features that aid self-presentation, networking, and public and private communication. Fifth is the virtual game world. Virtual worlds replicate a three-dimensional environment in which users can come into view in the form of modified avatars and work together with each other as they would in actual life. (Kaplan and Haenlein, 2010: 64). Sixth is virtual social worlds which have similar characteristics as Virtual Game Worlds. The only difference is that the user has more freedom to develop her character and is not limited to game mechanics (Braun, 2012).

Whether or not social media play a vital role in public opinion formation has both optimistic and skeptical views. Even though some researchers claim social media play a vital role to form public opinion, many researchers do not think so.

Optimistic theorists attempt to explore the positive role of social media on public opinion formation. Malcolm Gladwell (2010:49) said that social media makes it easier for activists to express themselves and harder for that expression to have any impact. Gladwell (2010) argued that revolutionists risk their lives and often become sufferers of aggression conducted by the police or the people their protest is directed at. Taking the guts to face risks would need strong social ties with others in the movement. The activism of direct action would involve high risks. The kind of activism associated with social media isn't like this at all. The platforms of social media are built around weak relationships" (Gladwell, 2010:45). Facebook and Twitter-dependent revolutions would only succeed in situations that do not necessitate people to make an actual sacrifice (Gladwell, 2010:47). Clay Shirky told about the role of social media in the formation of public opinion. The evangelists of social media believe that there is no difference between a virtual friend and a real friend. An example may be the signing up for a donor registry in Silicon Valley today is activism in the same sense as sitting at a differentiated

lunch counter in Greensboro in 1960 (Gladwell, 2010:46). Shirky (2008) argued that the political use of social media ultimately enhances freedom: social media creates what economic analysts would call a positive supply-side shock to the amount of freedom in the world. To speak online is to publish, and to publish online is to connect with others. With the influx of globally accessible technology, freedom of speech is now freedom of the press, and freedom of the press is freedom of community (Shirky, 2008:172). Jodi Dean (2005) argues, today's world is a communicative capitalist world obsessed with technological innovation like the internet, which creates a post-political situation. Busy people of the present world assume that they are active and technology will work for them to alleviate their faults and assure them that nothing will change too much due to their indirect participation, relationship with the community. Now people may think of themselves as political or social by participating in virtual gatherings, rallies, or a movement. They think that sending an e-mail, signing a petition, and responding to an article on a blog are the mainstream of being social or political. This feeling of mass creates a new age of communicative capitalism as it is less time-consuming, incremental, and riskless efforts of politics and culture (Dean, 2005: 70). This new nature of media that Dean presented advocates public opinion formation. Morozov (2010: xiii) further mentioned that our Internet-centrism forms a techno-deterministic ideology. Virtual activism can cause material and symbolic harm and could be a threat to the powerful such as the hacking activities of the anonymous group. Blocking of the sites of Amazon, Master Card, Post Finance, PayPal, and Visa as revenge for the companies' blocking of payments to WikiLeaks, blocking of government websites in Tunisia, Egypt, Libya, and Syria in solidarity with the Arab Spring may be a threat to the powerful. But online politics can simply be ignored by the powerful as these are harmless (Fuchs, 2013).

According to skeptical views, there is a class difference regarding mass inclusion and exclusion in online movement. The urban middle-class dominates microblogging in Western countries and even in China. Uneducated groups, Workers, peasants, aged people, and others are simply excluded from these activists. Their empirical results deconstruct the myth that the Arab Spring was a social media-based revolution. Social media and the Internet played a role like several other media, but empirical evidence does not sustain the assumption that social media were necessary conditions of the revolution (Fuchs, 2013). Lotan, Graeff, Ananny, Gaffney, Pearce, and Boyd (2011) analyzed 1,68,663 tweets from the Tunisian revolution and 2,30,270 from the Egyptian one. They found that journalists and activists were the main sources of re-tweets and that bloggers and activists were the most active re-tweeters. They found the difficulties to prove the evidence that supported the authors' claim that the revolutions were social media-based (1401). The analysis says nothing about the roles tweets had played in operating activists on the streets. In contrast to surveys and interviews with Egyptian activists, the analysis of tweets cannot provide conclusive evidence about the role of social media in the revolution. In March 2011, less than 1% of the Egyptian population used Twitter (Murthy 2013:107).

Shirky talked about two sides of social media but acknowledges that the positive side over-determines the negative one and social media has more positive effects on democracy than negative effects. Consequently, Shirky postulates the techno-deterministic

equation in this way: social media = more democracy = more freedom. Social media and the Internet are one among several media of movements, which played a positive or negative role to make a revolution or movement successful, but existent empirical evidence is not enough to uphold the assumption that social media are essential conditions of the revolution. Before social media, revolution, protestation was also established in other ways. So Social media played a role in protest communication alternatively not inseparably. Critical analysts have warned about the claims that Twitter constitutes a new public sphere (Morozov 2010, xiii).

3. Theoretical Background

Noelle-Neumann's spiral of silence theory explains the growth and spread of public opinion. This theory has similarities with the theory of seventeenth-century philosopher John Locke who regards public opinion as a concrete force that keeps people in line. Locke observed that the law of opinion is the only law by which people really abide (Griffin, 2008:372). After conducting 30 years of survey research Noelle-Neumann (1993:70-71) found that assessment of the public mood and sentiments is the most natural thing in the world for people to do. Noelle-Neumann's spiral of silence theory is based on four main principles: a) Fear of isolation, but cohesion in the social collective must be assured by a significant level of agreement on values and goals (Noelle-Neumann, 1991:258). b) Individuals are afraid of being 'socially isolated' (Sanders et al.1985: xvi). c) People continuously evaluate the condition of opinion through their personal associations and through the media in order to maintain a high level of consciousness regarding the social consensus (Moreno-Riaño, 2002:67). d) Based on their perception of the condition of opinion, people will be enthusiastic or unenthusiastic to speak out. People live in unending fear of isolating themselves and carefully scrutinize their situation to see which opinions increase and which decrease. If they uncover that their opinions are preponderate or increase, and then they convey themselves freely in public; if they find that their opinions are behind the supporters, then they become fearful, conceal their convictions in public and remain silent. It is based on the spiral of silence theory that one group of society (majority) expresses themselves with self-confidence whereas the others keep silent, the former appears to be strong in public, the latter weaker than their numbers suggest (Noelle-Neumann, 1981: 139).

One critical point of analysis of the spiral of silence theory is that exceptional people will never be silent although their cause of movement appears hopeless; they carry on to voice their opinions. Noelle-Neumann describes two types of a minority group of individuals whose voice remains at the top of the spiral in defiance of threats of segregation. One group is the hard-core people who have already been rejected for their voice and have nothing to lose by speaking out. Another group is the avant-garde group consisting of intellectuals, artists, and reformers in the isolated minority who speak out because they are influenced, they are ahead of the times (Griffin, 2008:379). The hard-core and avant-garde minorities are the only hope for future swings in public sentiment. The possibility to change or shape public opinion is reserved to those who are courageous of being isolated. They can carry their ideas to supremacy by conducting the unpopular or by

shocking the common society (Noelle-Neumann, 1979:155).

Noelle-Neumann's spiral of silence theory has relevance to the present empirical world but the online revolution created new scope to add some new insights to her theory. The nature of social media made new opportunities to speak out for those who are in minority. Amongst other changes like this, social media insists on revising the main arguments of the spiral of silence theory. Criticisms of Noelle-Neumann's theory are based on mass-media context. Here, the media have a strong influence on individuals which estimates the majority's opinion (Neuwirth, 2000:139) and on their conception of social reality and social climate (Shahanan, 2004: 414). Based on Noelle-Neumann's (1974) theory, three main characteristics of communicative activities of the mass media have been seen: ubiquity (mass media are omnipresent); cumulation (they are also repeated over time); and consonance (they are uniform across the mainstream media) (Oh, 2011:8). Social media offers a cheaper, faster, and more continuous analysis of public opinion. Public opinion formation through social media is less affected by the spiral of silence than media-based traditional opinion polls (Ceron et al., 2013:5). Researchers are increasingly exploring more and more benefits (e.g. anonymity declines people's fear of isolation increases their willingness to speak out) of using social media by the public to strengthen their voice.

In the 1970s, Habermas gave a definition of the public sphere. He described it as an abstract mediation between the state and society (Habermas 1974:50). For Habermas, the public sphere is a discursive area where individuals engage in rational discussion, deliberation, agreement, and action in an equal, democratic and pluralistic environment (Villa, 1992:712, Johnson, 2006). Following Habermas, Yun and Park (2011:202) in their study mentioned that a lot of online forums recently operate as a public sphere where people discuss, gossip, and express their ideas. The activation of an online spiral of silence takes us further from Habermas' thoughts. Noelle Neumann's theory is still applicable to the concept of public opinion within social media as it is within mass media, and further research should continue to grasp the relevance of Noelle-Neumann's work to contemporary politics. Social media and mass media both contribute to public opinion formation as traditional media allow people to enter the realm of public discussion and social media to build a climate of opinion considered in the light of an interplay between online and offline practices (Pepe & Di Gennaro, 2009).

4. Methods

This study employed triangulation- "the idea that looking at something from multiple points of view improves accuracy" (Neuman, W.L. 2006:149)- to explore different aspects of the movement. This study used the definition of public opinion as introduced by Noelle-Neumann (1993:178), "attitudes one can express without running the danger of isolating oneself". This definition can help to explain the type of opinion formation that was formed during the No-VAT on Education Movement. This study used survey and content analysis. Dhaka city is the location of the study. The agitators of the No-VAT on Education Movement (2015) were gathered at several points in Dhaka city (e.g., Dhanmondi 27, Banani-Kakoli Square, Badda, Uttara, and so forth). All the participants of *the No-VAT on Education Movement (2015)* are the study population of the current study. The researchers applied the purposive sampling technique for No-VAT on Education

Movement (2015) due to its difficult-to-reach respondents. The study took 100 samples for the survey. Content analysis has been used as the research design of the study. Research approaches are an unstructured and open methodology for the qualitative part. A structured questionnaire was used for the survey. Selective pages of Facebook, Twitter, and some individual accounts (that are publicly accessible) were analyzed as content analysis. The sample size for content analysis was 828 for Facebook, 289 for Twitter, and 228 for YouTube. These individual accounts were identified after searching by "No-Vat Movement" "No-VAT movement in Bangladesh" and "Social Movement" during 2017. After searching the term, the study collected screenshots of the pages. Since the pages were publicly available, the study did not take any permission to use them. Survey data was analyzed using SPSS software, and the data from the content analysis were analyzed thematically. The organization of data/findings is more descriptive and narrative in nature.

5. Result

5.1 Descriptive statistics

It is observed from the following Table 5.1.1 that the highest number of respondents (84%) has come from 21-25 age cohorts whereas age cohorts 11-15, 31-35, 36-40, and 41-45 have only 1% each. Age cohorts 26-30 and age cohorts 16-20 have 4% and 8% of the respondents respectively. Most of the respondents are Muslim (93.9%) and the second-highest is Hindu (5.1%) population. Only 1% of the respondents were Christian. From the Table, it is found that 62% of the respondents are male and 38% of the respondents are female. From the following Table 5.1.1, it is observed that 85.7% of the respondents are either honors or degree students; 5.1% passed HSC and 3.1% passed either honors or degree. Among the total respondents, only 2% are master's students; another 2% passed master's degree, and the other 2% have Mphil/PhD degree. Moreover, it is effortlessly seen that most of the respondents are students (92.9%) while only 1% are politicians and 2% are government employers. About 4% of the respondents are businessmen. Table 5.1.1 also confirms that most of the respondents are urban (82%) population while 18% are rural population.

Table 5.1.1 Descriptive statistics of the variables in number and percent

Variables	N	%
Gender		
Men	62	62
Women	38	38
Age		
11-15	01	01
16-20	08	08
21-25	84	84
26-30	04	04
31-35	01	01
36-40	01	01
41-45	01	01

Religion		
Muslim	93	93.9
Hindu	05	5.1
Christian	01	1.0
Education		
HSC	05	5.1
Honors/Degree student	84	85.7
Honors/Degree passed	03	3.1
Master's student	02	2.0
Master's passed	02	2.0
Mphil/PhD	02	2.0
Occupations		
Government Employee	02	02
Businessman	04	04
Politician	01	01
Student	93	93
Place of Birth		
Urban	82	82
Rural	18	18

Source: Field Study, 2017

Types of social media respondents use to know about the movement

It is effortlessly found that most of the respondents know about the movement through Facebook (80.6%) whereas the lowest number of respondents know about the movement through the local or international newspaper (1%). Interestingly, an almost similar number of respondents knows about the movement through national or international television (4.1%), local television channel (4.1%), face-to-face discussion (4.1%), word of mouth (3.1%), and local newspaper (3.1%) (Field Survey, 2017).

Nature and role of social media in public opinion formation

Among the respondents, 90% think that social media plays a role in forming public opinion, while only 8% do not think so. The study found that to facilitate the movement only 23% of the respondents used blogs. In addition, it is found that 90.9% of the respondents thought that social media made it easier to know, comment on, or share the content of the movement (Field Survey, 2017).

Types of the account used in the movement

It is found that the largest number of the respondents used an account with a valid identity or real name (83.9%), whereas 16.1% of the respondents used a fake/abstract-named account. But why do they use fake/abstract-named accounts? 45.17% of them said that it was easy to comment on risky subjects with fake/abstract-named accounts. They also answered that "pseudonyms reduce fear" (29.03%). But there were 12.9% who did not find any relation between the social media account and the movement (Field Survey, 2017).

Reasons for using social media during movement

The highest number of respondents used social media because it was less risky (40.7%) and the second-largest number of respondents said that they used social media because it had saved time (31.9%). About 17.6% of the respondents used social media because they thought it was effortless work. Some of the respondents said there is no need for real sacrifice (4.4%) in using social media. There were many respondents who thought that social media was used to spread propaganda (61%) to form public opinion. But there was a significant number of respondents (39%) who did not think so (Field Survey, 2017).

Comparative role of social media in public opinion formation

The study found most of the respondents thought that social media had a bigger role than mass media (69%) in forming public opinion in the movement. On the contrary, 31% of the respondents thought that social media was similar to mass media in terms of its role in opinion formation (Field Survey, 2017). The reasons for the popularity of social media are:

Ego-involvement in the movement

Among the total one hundred respondents, 58% thought that no ego was involved in the subject of the movement and the rest of the respondents (39%) said that ego was involved (Field Survey, 2017). The study found that the biggest number of respondents (77.3%) thought that self-interest played a bigger role in public opinion formation. On the other hand, the remnant (22.7%) of the respondents did not think so (Field Survey, 2017).

Effect of 'police attack' in the movement

It is found in the current study, that the largest number of respondents (70.5%) said that the 'attack of police' ignites the movement. But a considerable number of respondents (28%) didn't say so (Field Survey, 2017).

Social media's role in giving opinion

It is observed that 84.38% of the respondents agreed that social media made it easier to give an opinion on the movement, while 15.62% of the respondents disagreed with the statement (Field Survey, 2017).

Usefulness of social media to know about public support

Among the total of one hundred respondents, 88.7% thought that social media became useful to know about public support regarding their demands. In contrast, 11.3% of the respondents did not think so (Field Survey, 2017).

Nature of social media to know about public support

It is found that 82.1% of the respondents agreed that social media become an easier and cheaper medium to know the public support for the demand of the movement. The highest number of respondents (84%) agreed that social media had become the fastest medium to know about the public support for the demand of the movement (Field Survey, 2017).

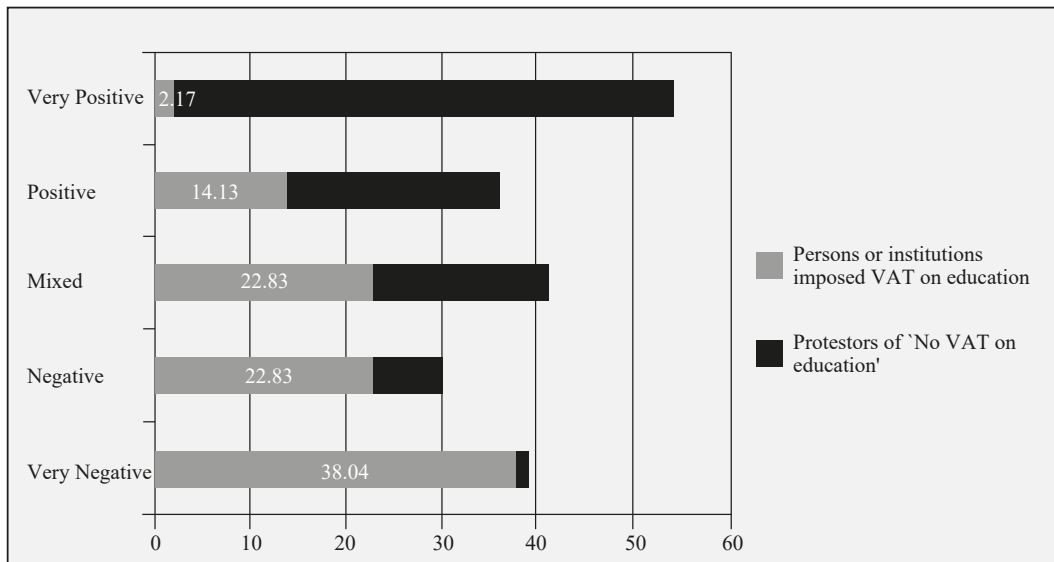
Fear of social pressure or social sanction

The study found that the majority of the respondents (56%) did not come back due to the fear of social pressure or social sanction in the movement. But a good number of respondents (44%) did come back due to the fear of social pressure or social sanction. In addition, it is found that 62% of the respondents justified their opinion to the majority's opinion before sharing their opinion or picture on social media to know whether that is similar to one another. On the other hand, 38% of the respondents did not justify their opinion to the majority's opinion for the same purpose (Field Survey, 2017).

Attitudes toward persons or institutions who imposed VAT on education and the protestors of the 'No VAT on education' movement

It is found (see Figure 5.1.1) that the highest number of respondents saw the protestors of the movement very positively (52%), while only 2.17% of the respondents saw the persons or institutions who imposed VAT on education very positively. On the contrary, the highest number of respondents saw the persons or institutions who imposed VAT on education very negatively (38.04%) whereas only 1% of the respondents saw very negatively the protestors of the movement. The rate of negative attitudes toward the persons or institutions who imposed VAT on education (22.83%) was also significantly higher than the protestors of the movement. 22% of the respondents saw positively the protestors of the movement, while 14.13% of the respondents saw positively the persons or institutions who imposed VAT on education. About 18% of the respondents have mixed attitudes toward the protestors of the movement and 22.83% of the respondents have mixed attitudes toward the persons or institutions who imposed VAT on education.

Figure 5.1.1 Percentage distribution of respondents by attitudes about persons or institutions who imposed VAT on education and the protestors of the movement



Source: Field Study, 2017

5.2 Content Analysis

From the 1345 comments, status, and shares from identifiable, non-identifiable, male-named, and female-named accounts on Facebook, Twitter, YouTube during the movement, the researchers have found the following findings. Moreover, the findings of content analysis help us to understand the opinions regarding 'No-Vat on Education Movement' from the leaders, participants as well as experts:

Table 5.2.1 Factors of public opinion formation for the movement

Factors	Leaders of the movement	Participants of the movement	Experts
Information level	High	High	High
Mental images	Government is responsible for VAT imposition	Finance Minister is responsible for VAT imposition	The government is wrongly dealing with the case
Attitudes			Imposing VAT on education is a negative approach
Values	<ul style="list-style-type: none"> • VAT on education is bad • Differentiating private and public universities on VAT issues is not fair 	<ul style="list-style-type: none"> • VAT on education is bad • Differentiating private and public universities on VAT issues is not fair 	VAT on education is a bad sign for development
Group membership	Online groups are cheaper, easier, faster, and risk-free platforms to form an opinion	Online groups motivated to participate in the movement	Social media help to organize students from different universities in a single platform easily and quickly
Leadership	Leadership became easier and faster due to social media	Leadership became easier and faster due to social media	Social media was an effective tool for the leaders in the movement

Source: Contents of comments, status, shares of different social media users during the movement

6. Discussion

Social media played a vital role in public opinion formation though the significant role of mass media cannot be ignored. The study found that social media has been used as a platform for overcoming some obstacles to expressing alternative views which were impossible in other ways. The nature of social media gave the protestors the opportunity of organizing the movement. For example, one can share his own view without disclosing his real identity. The study also observed that social media had been used not only to form an opinion in favor of a movement but also it was used to foil the movement using propaganda. Many authors acknowledged the potential use of propaganda (e.g., Lasswell, 1927; Moy & Bosch, 2013). The findings of the research shows that the strength of social

media not only speeds up the movement but also foil it. Social media helps the public more than other media to express their opinions regarding support or protest of a movement directly or indirectly.

Moreover, Shirky (2008:304) talked about our social tools' ability to improve our capacity to share, co-operate, and act together. As everyone from working biologists to angry air passengers adopts those tools, it is leading to an epochal change". Moreover, Papacharissi (2010:131) stated that people's regular online activities like "tweeting, participating in a 'MoveOn' online protest, expressing a political opinion on blogs, viewing or posting content on YouTube, or posting a comment in an online discussion group" would constitute "an expression of dissent with a public agenda". The potentially powerful acts of dissent emanate from a private sphere of interaction. This means that the citizens are engaged and enabled politically through a private media environment located within the individual's personal and private space to make opinions strong enough to win a movement (Papacharissi, 2010:131). The engagement opportunity of the public sphere via social media makes public opinion formation easier. The findings of the present study support these statements. For example, it is observed in the movement that demonstrators used their private social media groups to organize the movement. Due to the cheapness and easy accessibility of social media, people of all classes, gender, educational and social statuses use these apps to propagate myths or reality, as observed in the findings.

Young (1956: 338) gave an example of Laswell's concept of 'cross-pressure' to discuss the influence of different group views on an individual. When a person belongs to different groups and faces a conflicting position of different groups is a cross-pressure for that person. This type of cross-pressure was evident in the NO-Vat on Education Movement. Furthermore, in the NO-Vat on Education Movement, many government supporters and participants wanted no vat on education. So, a group of people was in cross-pressure. Earlier literature showed that information level, mental image, attitudes, values, group membership, leadership, events, and media are important factors of public opinion formation (Young, 1956; Cantri, 1942), which was also high in the discussed movement. Moreover, it is found that social media facilitated leadership during the movement. Furthermore, the influence of a particular event on opinion has been found in the movement. For instance, in the movement, sharing a photo of the wounded deputy registrar of EAST WEST university on social media triggered participation in the movement. So we can say that both public and government observe the mass reactions via social media and make the movement a successful or failed outcome. On the other hand, unlike the spiral of silence theory, people assessed the climate of opinion in a very short time during the movement. The movement was against a government decision and was triggered by the news of a 'police attack' on an East-West university officer. EWU Rainbow News- a Facebook page- played the role of Avant-garde in the movement. In the No-VAT on Education Movement, it is found that 'agitators' are inviting people using YouTube videos to join in the movement. It is also found that 'agitators' of the movement shared defamatory videos against the then Finance Minister on YouTube.

Curran (2012:53) claimed that the revolutions like the Arab Spring have intensive economic, political, and religious causes. Digital media or social media contributed to building-up dissent, facilitating the actual organization of protests, and disseminating news of the protests across the region and to the wider world (Curran, 2012:54). The findings of the present study are relevant to Curran's position. Although, it cannot be stated that the discussed movement is Facebook or Twitter movement. However, social media has a deep influence on the organization of the movement. Sharing, commenting, uploading videos and giving status regarding physically existed events of movement actually help the masses to achieve their goals. Although this study could not identify exactly how many social media users used social media to form an opinion for the movement, it is observed that many social media users expressed their views using social media which was quite impossible to express otherwise. This opportunity of expressing views without disclosing identities encouraged speaking out of the people who live in perpetual fear of isolating themselves. Thus, social media opened a new window for speaking out even when living in a minority group.

From the above discussion, we can summarize that movement, revolution, or public opinion formation regarding the social, cultural, religious, or political issues are historically passed from one epoch to another; transform from violent to non-violent, or turn into virtual movement from physical or direct one. Social media plays a vital role in the transformation of public opinions or movements. A large part of the educated, conscious and young folk of Bangladesh form new types of social movements with the help of social tools. The success of the movement 'No-vat on Education' relied on social media beside the roles played by other media. Among social media, facebook is the most used media by actors of the movement. It is also seen that social media have been used by both supporters and opponents of the movement. Minority and majority divisions among social media users justify the success or failure of the movement. In short, the expression of diverse opinions becomes possible due to the rapid expansion of social media which helps to spoil or speed up the movement on social, political or any sensitive issues.

7. Conclusion

Social media is a strong factor in public opinion formation but becomes stronger with the help of mass media. Social media made some factors like mental images, leadership, events, and attitudes more effective. The present study agrees with some arguments of the spiral of silence theory. For example, assessing the climate of opinion through social media, the 'hard core' and the 'avant-garde' can change public opinion. However, this study disagrees with the idea of fear of isolation of the spiral of silence theory. Rather, different types of factors like account type (i.e., account with real identity or account with fake identity) and government support or political affiliation can reduce the fear of isolation. This study could not measure how many people use social media to form public opinion. In addition, for the No-Vat on education movement, respondents were taken only from Dhaka city for the survey. Hence, the participants of the movements are seen living across the world. Thus, further studies are imperative to find out the types of people using social media to create, propagate or foil a movement or a public event. However, the present study has confirmed the great contribution of social media to make

the issue of a movement accessible to everyone irrespective of their geographical location, gender, or education but with everyone's consciousness.

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Empowering Women through STEM Education in Bangladesh: Problems and Prospects

Submission: 06-12-2017
Acceptance: 10-03-2022

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Abstract: *This paper mainly focuses on the role of Science, Technology, Engineering and Math (STEM) education in empowering women to participate in the development process. By using Bronfenbrenner's Bioecological model the study is designed to understand the influences of the relationship with parents, siblings, school teachers, cultural and social beliefs on their participation in STEM. It also represents different social, cultural barriers to the participation of women in science-related fields and how they are overcoming these barriers in recent days. The study is based on both primary and secondary sources of information that involves document analysis and field level data. The involvement level of women graduates and faculty members of the science, humanities, and social science at Dhaka University, Jagannath University, and the Center for Advanced Research in Sciences (CARS), University of Dhaka has been demonstrated. To make the study more representative, the Focused Group Discussion method was used on 10 female students from Jagannath University and 10 female students from Dhaka University of science faculty to understand their confidence, interest, barriers, and career plans in STEM. It is argued in the study that STEM education promotes women's participation in IT sectors, engineering, medicine, and biotechnology in Bangladesh and leads to the ultimate success of the country's economy. Religious, cultural, and social structures are the major barriers to bringing them into STEM and changing their life. It suggests a set of measures to be taken to overcome the barriers to ensure women's empowerment in the STEM field.*

Keywords: Barriers, Confidence, Empowerment, IT, STEM

1. Introduction

The ongoing changes in the modern world with cognitive technological development require scientific aptitude and skills in the STEM educational process. Substantive gains can be obtained by improving women's contribution to STEM. Providing the men and women with the correct knowledge, valuable aptitudes, and good technical abilities is possible through science education which develops self-reliance and generates employment. Keeping social fairness in mind to increase the involvement of women in STEM fields is very much apparent.

In Bangladesh, women have made great strides in education and also in employment over the years. However, despite this success, the rate of women education continues to be underrepresented in the fields of science, technology, engineering, and math, collectively known as STEM (Modi, Schoenberg, and Salmond, 2012). Although women's education is a major concern as their literacy rate is low (72.76%) (UNESCO, 2016), their participation in science education is still not satisfactory. UNESCO Institute for Statistics (UIS) has estimated that of the world's total science researchers, only 27 percent are

women. Women scientists are most poorly represented in Bangladesh (14%) (UNESCO, 2010). In our society, there are so many social, economic barriers that hinder women's participation in science education and also continue their career in the science profession.

Bangladeshi people always had a fixed mindset that the only working person would be a male and not a female. Even, they had the wrong perception that science subjects would be only for boys. However, presently people are improving their thoughts and a lot of women are showing their interest in technological sectors besides men. Although the rate of women education in science and technology has increased over the years and their participation also in the workplaces, it would not reach a satisfactory level. To keep up the pace with the world of globalization and modernization, the importance of STEM is unexplainable nowadays. Due to technological advances, newer job opportunities are being created in IT, engineering, medicine, and biotechnology sectors in Bangladesh. Only education in STEM can change the fate of women as well as the country's development.

Now it is time to focus on understanding obstacles, preventing more girls from STEM and developing solutions for how girls can better become engaged in STEM. Gender barriers are still high for girls and several cultural, social, and individual factors prevent more girls from entering and having a career in STEM fields.

In this context, to ensure a sustainable future for Bangladesh, the country needs to consider STEM as an important catalyst. We need more scientists and innovators and only proper STEM education can hold the key to this success. We must strengthen girls' education in STEM subjects, as it will not only help increase their meaningful participation in STEM activities but also help change the exploitative conditions in STEM-related industries. Women's participation in STEM fields can bring economic progress for them, their families and fuel the growth of the economy of Bangladesh.

2. Objectives of the Study

The main aim of this study is to investigate how STEM education contributes to women's empowerment by transforming them into human resources with modern technology. Following this aim, the specific objectives of the study are mentioned below:

- a. To investigate the problems of women's STEM education in Bangladesh.
- b. To understand the prospects for the engagement of women with STEM in the country's development.

3. Literature Review

This section discusses the previous studies which explicitly explain the problems and prospects of STEM education for women in Bangladesh.

3.1 Problems of women in STEM education

Choudhury (2010) highlighted the correlation between science education and development. The author argued that the quality science education for women is equally important as for men and therefore, a sound policy and necessary steps should be taken by relevant stakeholders to upgrade the status of women in the science and engineering

education field. Nath, Sireesha & Manjunatha (2020) highlights the importance of women's engagement in science for human resource development by enlightening the efforts of the Indian government and the United Nations toward science education and research. Parents and family play an important role in career decisions for girls. Most of the time parents have quite fixed ideas of what careers they wanted for their daughters. Many parents give more importance only to attaining a degree than their daughter's career plans (Saville, 2014). Moreover, gender discrimination, career preferences, and lifestyle choices, disinterested to study science subjects, hostile working environment, poor professional, financial support, and amplified work-family conflict hinder women's participation in STEM (Devi, 2017; Smart & Rahman, 2009; Nath, Sireesha & Manjunatha, 2020). Economic factors might affect parents' ability, usually referring to the money required to pursue higher education. Social factors (such as tradition, religion, and cultural expectation) might affect their ability to fulfill their ambition. Even for highly qualified women scientists, traditional roles pressure them to be responsible for the majority of the household work. As women give up their research and careers, their talents go to waste (Saville, 2014).

Blickenstaff (2005) did research on some factors to understand the reasons behind the absence of women in STEM careers in most industrialized countries. It was found that the difference in the size of men's and women's brains was the cause of female intellectual inferiority. However, it is not certain that this difference is not enough to explain the underrepresentation of women in STEM careers. The author found from the study by interviewing girls about their attitudes toward science that girls enjoyed their science experience in school but could not imagine themselves as a scientist. He also found some discrimination in curriculum materials and design as largely absent of girls' contributions in the textbook about science. In addition, women display less confidence in their STEM-related abilities while men report more confidence throughout their education, careers, training, and professions. Women are more likely to report a lower perception of professional support for family issues. However, professional support allows women to feel confident and respected by taking equal part in important decisions (Saville, 2014).

McCullough (2011) described that the lack of role models and mentors is one of the problems discouraging women to enter technical fields. One of the challenges women face is the lack of role models. It is very hard to imagine something you cannot see. A girl needs to see confidence, leadership, and accomplishment in other women to envision herself with those qualities (Saville, 2014).

Chowdhury, Arefin & Ahmed (2019) mainly worked in their paper to explore the key factors and major challenges behind the implementation of the STEM education system in Bangladesh. According to their primary findings, more than 80% of the respondents agreed that inadequate infrastructure, lack of resources, and lack of training, as well as professional development, are the key factors to implement STEM from primary to tertiary levels in Bangladesh. Alam (2008) pointed out the importance of the technical,

technological, and vocational programs in the education system for transforming the population as human resources in Bangladesh. In this context, the Bangladesh government has started ICT in the education system by providing computers in every school with internet connections (Seddiky & Ara, 2015).

3.2 Prospects of women's STEM education in Bangladesh

Women's participation in STEM in our country is not satisfactory. However, recently they are trying to make their career in science and technology. The Organization for Women in Science for the Developing World (OWSD) provides research training, career development, and networking opportunities for women scientists throughout the developing world. In 2017 & 2018, two Bangladeshi researchers won the OWSD-Elsevier Foundation Awards for Early-Career Women Scientists in the developing world. Dr. Tanzima Hashem, Associate Professor at the Department of Computer Science & Engineering (CSE) of Bangladesh University of Engineering and Technology (BUET) was one of five researchers who won the 2017 OWSD Elsevier Foundation Awards for her work in developing computational approaches to protect the privacy of people accessing location-based services. Dr. Tanzima's main focus of the research was to allow people to have control over sensitive data about their health, habits and was about while accessing location-based services (Noushin, 2017). She was working to develop a technology-based solution to collect harassment data & workplace feedback in a manner that preserves privacy. This application will help women to find safe paths to travel from one place to another by using harassment data. On the other hand, workplace feedback can help the government to monitor the actual scenarios of workplaces. Dr. Hasibun Naher, Associate Professor in the Department of Mathematics and Natural Sciences at BRAC University won the 2017 OWSD Elsevier Foundation Awards for her work in a nonlinear partial differential equation in the applied mathematics category. She recently worked on tsunami simulation & conducted research on traveling waves ("Bangladeshi scholar wins", 2018). Jennifer Thomson, president of the OWSD, said that these scientists are living proof that if given the opportunities and support, women all over the world can become leaders in their field ("Bangladeshi scholar wins", 2018).

If the women in Bangladesh and STEM go hand in hand, it would be possible to make scientific and technological advancements and this contributes to the country's overall development.

The Honorable Minister for Post, Telecommunication and Information Technology Mr. Mustafa Jabbar in the Round Table Discussion on Women in STEM: Perspectives, Challenges and Prospects on 11 January 2018 said that-ensuring equal participation and proper involvement of women in STEM areas, tremendous changes will be possible ("Women in STEM", 2018).

While learning from the relevant studies, this study attempts to fill the gap by examining the role of STEM education for women in human resource development and the problems they face in a STEM career. Several studies are found to be conducted about social

barriers and challenges of women in STEM education and career in different countries but no specific study on the challenges and prospects of STEM education by which they can be empowered is undertaken in the context of Bangladesh.

4. Conceptual Framework

4.1 Stem education: The term "STEM education" refers to teaching and learning in the fields of science, technology, engineering, and mathematics. (Gonzalez, 2012). STEM education has become the topmost priority of researchers, policymakers, educators who believe that the involvement of women in science and technology could change the fate of women as well as the country's development. (Modi, Schoenberg and Salmond, 2012). STEM education, "Science, Technology, Engineering, and Mathematics education" programs are defined as those primarily intended to provide support for or to strengthen STEM education at the elementary and secondary through postgraduate levels, including adult education" (Brown, 2012).

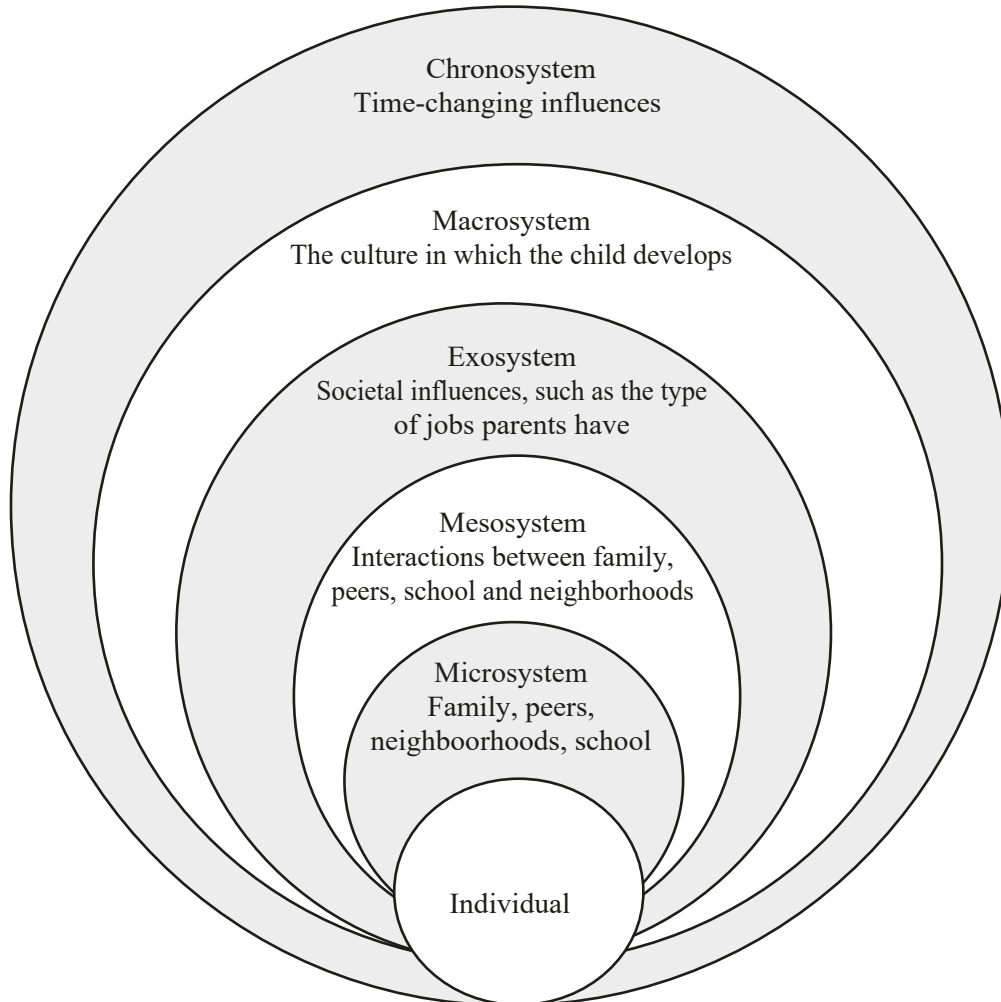
4.2 Women empowerment: In the 1990s, development programs boosted the role of women's empowerment in economic development and human development. However, the term women's empowerment was firstly defined by the United Nations after the 4th World Conference on Women: Action for Equality, Development, and Peace in Beijing in 1995. The United Nations identified that women's empowerment has five components: women's sense of worth, their right to have and determine choices, their right to have access to opportunities and resources, their right to have the power to control their own lives- both within and outside the home, and ability to influence the direction of social change to create more just social and economic order, nationally and internationally (Bradley, 1995).

In this study, women's empowerment is defined as a process of achieving women's ability to make decisions about their health and bodies, employment and political representation at all levels from individual to state.

5. Theoretical Framework

For this study Bronfenbrenner's (2005) Bioecological model is grounded in explaining the impression of hypothesized influences on girls' interest, confidence, and career choice in STEM education. Specifically, this theory is utilized to address the relationship between the factors of self-efficacy, socio-economic factors, parental encouragement, teacher influences, and peer influences on girls' confidence and interest in science. Bronfenbrenner's model consists of five systems of sociocultural development including the microsystem, mesosystem, exosystem, macrosystem, and chronosystem (Bronfenbrenner, 2005).

Figure 5.1 Bioecological Model of Human Development



Source: Bronfenbrenner, 2005

The first system is the microsystem, which consists of an individual's living environment, which includes family, peers, school, and neighborhood. (Bronfenbrenner, 2005). It encompasses an individual's human relationships, interpersonal interactions, and immediate surroundings. For example, the relationship between an individual and his or her parents, siblings, or social environment. The interconnections and connections between the microsystems make up a mesosystem. (Bronfenbrenner, 2005). For example, the relationships between teacher influences, parental influences, and peer influences are examined to determine the extent to which they have an impact on girls' confidence and interest in science. Exosystems are links between two or more surroundings that have an indirect influence on the child's life (Bronfenbrenner, 2005). For example, if a parent were to lose their job or have their hours cut back, this would affect their child in an indirect way such as financial strain or increased parental stress. Macrosystems are

comprised of cultural and societal beliefs and programming that influence an individual's development. Discrimination and biases are still major factors that keep women from participating in science and technology. For example, girls think that studying math and other areas of STEM is beyond their capacity and lack the confidence to display their competency. Teachers' positive attitudes, parents' engagement, and peer attitudes are the major influences that grow the interest of girls in STEM. Chronosystems focus on the relationship between a person's traits and the environment in which they live across time (Bronfenbrenner, 2005). When we think about how we can inspire and influence girls to consider a career in STEM, a starting point must be to showcase more role models of young women, happily working in exciting STEM roles today. Several factors contribute to low confidence in girls in science. Confidence in science is significantly impacted by teacher influences. Parents and teachers can do a great deal to increase the interest of girls in STEM subject areas. Teacher support, parent involvement, and peer behaviors are important factors that help or hinder interest in science. Girls prefer the areas of study that help people and deal with the earth while boys are interested in physics and technology. Teachers can have a large impact in cultivating these interests. Parents of girls encouraged their children to become teachers and doctors while boys were encouraged by their parents to think about becoming an engineer. This support and high expectations from parents of their female children are critical to the success and retention of girls (Tabetha A, 2013).

6. Methodology

This paper is based on both qualitative and quantitative methods. Data was gathered from both primary and secondary sources. A focus group discussion has also been used for face-to-face interviews with the girl's students based on a semi-structured questionnaire to collect information on their ideas and knowledge of STEM, career plans, challenges, and so on. 10 female students from the faculty of science of the University Dhaka and 10 female students from faculty of science of Jagannath University have been selected as participants for the study between the ages of 20-24 applying the purposive sampling method. Secondary data was collected from different relevant publications, books, journals, newspapers, websites, etc. The quantitative portion consists of official statistics of Dhaka University, Jagannath University, and the Center for Advanced Research in Sciences (CARS), the University of Dhaka to show the participation rate of women teachers, researchers, and students in science faculties along with arts and social science faculties. Finally, based on focused group discussion and Bronfenbrenner's Bioecological model, the discussion section tries to make a deep analysis focusing on factors like socio-economic, cultural beliefs, and religious barriers to complete this study.

7. Findings of the Study

7.1 Quantitative data analyses: In the study the University of Dhaka, Jagannath University and the Center for Advanced Research in Sciences (CARS), University of Dhaka is taken as the research area to show the comparative analysis of male and female teachers, scientists, and students of different faculties to understand their participation level.

Table 7.1.1 Women teachers in different faculties of Jagannath University

Faculty	2017-18			2018-19		
	Male	Female	Total	Male	Female	Total
Science and Life & Earth Science	158(61%)	103(39%)	261	166(61%)	107(39%)	273
Arts	87(64%)	49(36%)	136	88(61%)	55(39%)	143
Social Science	68(52%)	62(48%)	130	70(52%)	65(48%)	135

Source: Annual Diary of Jagannath University, 2017-18&2018-19

The percentage of female teachers in the science faculty of Jagannath University is not so bad compared to arts and social science faculties while their percentages compared to their male colleagues is not far from satisfactory.

Table 7.1. 2 Women teachers in the science of Jagannath University

Faculty	2017-18			2018-19		
	Male	Female	Total	Male	Female	Total
Chemistry	23(82%)	5(18%)	28	23(82%)	5(18%)	28
Math	16 (73%)	6(27%)	22	21 (78%)	7(22%)	28
Physics	18 (69%)	8(31%)	26	18 (69%)	8(31%)	26
Statistics	13 (62%)	8(38%)	21	13 (65%)	7(35%)	20
Computer Science & Engineering	11 (61%)	7(39%)	18	12 (60%)	8(40%)	20
Total	157(60%)	104(40%)	261	167(61%)	107(39%)	274

Source: Annual Diary of Jagannath University, 2017-18&2018-19

The percentage of female teachers at Jagannath University is far from satisfactory compared to their male colleagues.

Table 7.1.3 1st-year Students in different faculties of Jagannath University

Faculty	2017-18			2018-19		
	Male	Female	Total	Male	Female	Total
Science and Life & Earth Science	592(68%)	278(32%)	870	537(54%)	449(46%)	986
Arts	363(53%)	320(47%)	683	314(45%)	379(55%)	693
Social Science	302(50%)	302(50%)	604	282(46%)	328(54%)	61

Source: Students enrollment registration book of Jagannath University,2017-18&2018-19

Table 7.1.3 shows that the percentages of female students in science faculty is less in both the year compared to the male students. On the other hand, in both the faculty of arts and social science, the number of female students are almost the same or high compared to male students.

Table 7.1.4 1st year Students in science Faculty of Jagannath University

Faculty	2017-18			2018-19		
	Male	Female	Total	Male	Female	Total
Chemistry	64(74%)	23(26%)	87	46(82%)	35(18%)	81
Math	61 (72%)	24(28%)	85	46 (73%)	28(27%)	74
Physics	63 (75%)	21(25%)	84	33 (69%)	43(31%)	76
Statistics	61 (73%)	23(27%)	84	90 (62%)	47(38%)	137
Computer Science & Engineering	47 (89%)	6(11%)	53	69 (61%)	15(39%)	84
Total	592(68%)	278(32%)	870	537(54%)	449(46%)	986

Source: Students enrollment book of Jagannath University, 2017-18&2018-19

Table 7.1.4 shows that the percentage of female students of Jagannath University is less compared to the male students.

Table 7.1.5 Women teachers in different faculties of Dhaka University (2019-20)

Faculty	Male	Female	Total
Arts	228(68%)	109(32%)	337
Science	151(78%)	43(22%)	194
Social Science	172(56%)	137(44%)	309
Earth and Environmental Sciences	63(77%)	19(23%)	82
Engineering & Technology	103(83%)	21(17%)	124

Source: Website of University of Dhaka, 2019-20

Table 7.1.5 shows that the percentage of female teachers in the science faculty of the University of Dhaka is not so bad compared to arts and social science faculties while their percentages compared to their male colleagues is not far from satisfactory.

Table 7.1.6 Present numbers of Scientists and research fellows of (CARS)

Scientist & Fellows	Male	Female	Total
Chief Scientist	-	01	01
Principle Scientist	03	01	04
Senior Scientist	03	03	06
Senior Scientist (Software Lab)	01	-	01
Senior Computer Scientist	01	-	01
Post-Doctoral fellows	02	-	02
Research fellows	01	04	05
In Total	11(55%)	09(45%)	20

Source: Website of CARS, 2019-20

Table 7.1.6 indicates that the percentage of female scientists and fellows in CARS is not so bad compared to males. It is quite satisfactory that the chief scientist is female and most of the research fellows are female.

7.2 Findings from Focus Group Discussion (FGD): To supplement the quantitative data, this section has incorporated the information based on FGD. The section has represented data under a few major themes that include girls' thinking towards STEM, support from family and teachers, barriers in STEM, career opportunities in STEM, women's role in the country's development, and empowered women by STEM.

7.2.1 Girls thinking are toward STEM: They are well known in STEM fields and choose their STEM subjects on their own. They believe that their experimental thoughts could be gained by STEM and this is very useful for the progress of mankind. But they think that most of the girls want to continue in science education but they depart from this stream only for the education system based on the admission test which is required to enter into university. In addition, they face problems in understanding mathematical terms, a shortage of laboratories, and teachers' unfriendly attitudes.

One of the respondents named Tasfia Tabassum, department of Chemistry, University of Dhaka, said that, "I love science since my childhood. I always like doing science projects. It gives me chances of doing something new and innovative."

7.2.2 Support from family and teachers: Some STEM girls have more support from parents, family members and teachers. They said that their parents gave them the full opportunities to do what they want. Even sometimes they got encouragement from their parents. However, most of the girls said that their parents didn't let them study science. They had to get consent from their teachers and other family members. In particular,

teachers play a key role in pushing them into STEM. From the textbooks and newspapers, they also got the inspiration to choose these subjects.

7.2.3 Barriers in STEM

STEM girls faced different barriers in this field. Guardians' conservative outlook demotivated them not to choose these subjects. Early marriage also affects their education. Some girls said that as their financial condition was not good, their parents didn't allow them to study science. However, finally, only for their interest in science, their parents did hard work for managing money. In addition, they said that fewer opportunities and infrastructure barriers are responsible for the continuation of STEM. Some girls also said that they faced gender barriers.

According to Farjana Yeasmin, Department of Physics of Jagannath University mentioned that, "Because I am a girl, I wouldn't be treated equally as my brother. My parents allowed him to study science but not me though finally, they agreed." Some girls think themselves too weak to continue in STEM education. They think that they are not fit and capable to do work in the fields of technology. STEM girls are well known for career opportunities in STEM like IT sector, engineering, etc. Although interest in STEM is high, few girls are interested in STEM career. They said that if they went into a STEM career, they will have to work hard and spend more time compared to another job. Some girls expressed their views that employers in the fields of STEM do not usually want to hire women due to their family responsibilities. However, most of the girls are very much interested in STEM careers but they think they need support and confidence so that they feel comfortable with the areas in STEM careers. They believe that being part of the scientific world, they will get better living standards and career opportunities. Moreover, they believe that STEM education will improve women's efficiency, self-identity and contribute to reaching them into a strong position.

7.2.4 Women's role in country's development

The respondents said that STEM jobs contribute to the nation's economic expansion. So half of the population of the country should come to this field. That's why women's skills should be considered and more women need to be recruited in these fields which will enrich the fields of scientific research and activities. According to Syada Tasmia Alvi, from Jagannath University's Department of Computer Science and Engineering, "I am a very hard worker. I feel whatever boys can do, I can also do this. I think I could do better in STEM jobs and could play a vital role in the country's economy."

7.2.5 Empowered women by STEM

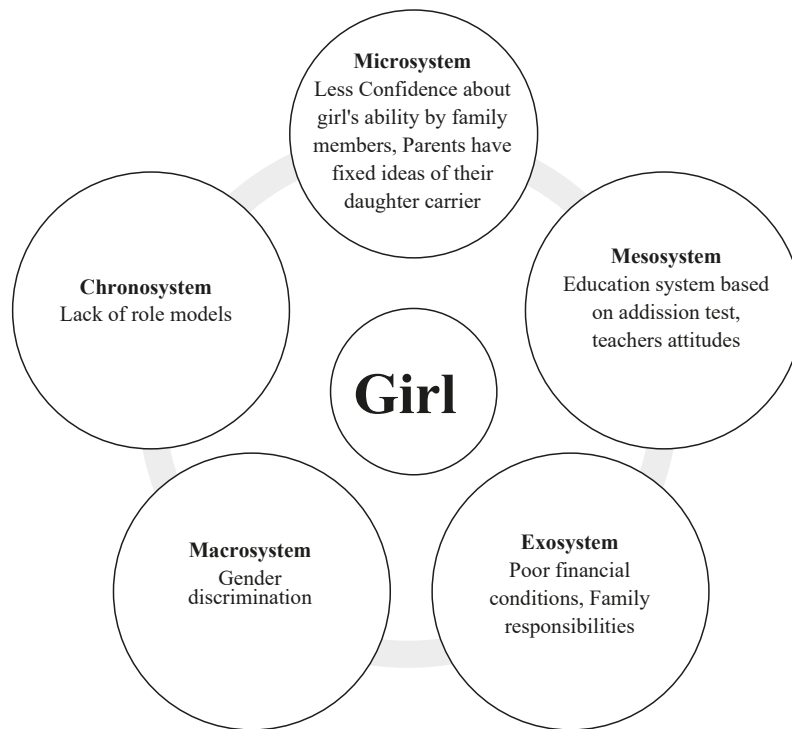
Respondents said that by STEM education they can acquire knowledge regarding analysis, problem-solving, doing a calculation, and giving logic, etc. Therefore, through this process, they get the chance of being empowered by achieving the positions i.e executives, scientists, and researchers which can be the role models for the next generations. Consequently, they can make any decisions logically.

Maliha Tabassum, a student of Statistics of the University of Dhaka stated, "I think that girls could do better in these fields but they need more opportunities. They should be given a chance to make decisions. Most of the time they lose this power because of gender barriers."

8. Discussion

Based on the findings of this study, this section deeply discusses the following four issues a) microsystem, b) mesosystem, c) exosystem, d) macrosystem and e) chronosystem from the bioecological model.

Figure 8.1 Girls' interest and confidence in STEM education- Adaptation of Bronfenbrenner's (2005) Bioecological model



Source: Prepared by the author

The biological model discussed socio-economic and cultural beliefs and status to understand the girl's engagement in STEM. Women face many social, economic, cultural and religious barriers that prevent them from getting access to STEM education.

From the microsystem of the Biological model, it is found that parents and other members of the family have less confidence in a girl's ability, and most of the time they have preconceived ideas about their career choices. Dr. Mahmuda Naznin, Professor in the Department of Computer Science and Engineering (CSE) at BUET, believes that this is the worst misconception that people in our society possess about women's professional capabilities. She expressed her own experience that without her mother, other family members were less encouraging (Choudhury, 2019).

In the mesosystem, teachers' influences, the education system, and institutional facilities play an important role. In the context of Bangladesh, girls don't get support from family members. Sometimes, teachers play an important role in drawing the interest of girls in

the STEM subject areas and convincing their parents. In the FGD, most of the participants responded that their parents didn't let them study science initially; they had to take consent from their teachers.

If we look at the exosystem, it is found that poor financial conditions, family responsibilities, and early marriage are the important factors that prevent girls from this stream. In the FGD, some participants expressed that their parents didn't allow them to study science only for their poor financial conditions. However, finally their parents could manage money by working hard.

In the macrosystem, this study found that gender discrimination and biases are still major factors that keep women away from the fields of science and technology. Rita Yusuf, Professor and Dean at the School of Life Sciences at Independent University, Bangladesh faced gender discrimination in primary school when teachers would scold and embarrass her severely in front of classmates for relying on a boy for asking help with something like woodwork class or any activity traditionally considered male-centric (Choudhury, 2019). There is still a lack of role models to inspire and influence women to consider a career in STEM.

The chronosystem also focuses on the environment in which they live. Participants from the FGD felt that ensuring women's positions in higher ranks such as executives, scientists, and researchers, can serve as the role models for the next generation. Dr. Lafifa Jamal, Chairperson, Department of Robotics & Mechatronics Engineering, University of Dhaka, the President of Bangladesh Women in Technology said that only 16% of the IT sector is occupied by women and the gender ratio gets much worse in the mid to higher level. As a teacher, she observed that girls have lack of confidence and are afraid of growing a career in programming. She said, 'I see my male students working late hours at night on campus but girls hardly do so.' She requests girls that whatever obstacles will come, they must not lose track rather continue to dream (Choudhury, 2019). As a result, the findings of the study seem to be consistent with the bioecological model.

From the above findings, it is seen that Bangladesh is still far away from the current STEM wave. STEM subjects are closely related to different parts of society and development from economy to mathematics, medical research to chemistry, and biology. In this digitalized world STEM education is very important for capacity building through different IT-related job opportunities. Moreover, women believe that through STEM education, they can play an important role in the country's overall development. It is important to explain that young generations are very conscious about their career in STEM and they are capable too. Therefore more women need to be recruited in these fields. At the same time more support and cooperation are needed to make them feel comfortable in these areas and thus to make them empowered in this field.

9. Conclusion and Recommendations

A country's development is not possible without the participation of women who constitute half of the total population. Though girls' education is progressing rapidly in

Bangladesh, they are still far away from the current STEM wave. Lack of family support is one of the biggest challenges for girls in Bangladesh. With the support of family members as well as the policymakers of the country, more girls and women can be involved in STEM areas. It enables them to set their career in the STEM field. In a modern digitalized world, girls cannot make progress if they are not equipped with scientific and technological knowledge. A well-organized STEM program for women may help Bangladesh to improve its economic growth. Therefore, the country urgently needs to take substantial steps if she wants to develop herself.

As it is seen that the participation rate of women in STEM education is not satisfactory. There should be organized efforts to increase the involvement of women in STEM education. STEM education should be compulsory from primary to graduate study in our education system. In this context, the Government should make a plan for girls' STEM education in the future education policy. The Government can also provide incentives to schools for developing programs to promote STEM education for young girls. It will enable girls to participate in STEM education and careers. Social barriers, gender bias should be removed from society and a gender friendly environment should be created in which women feel comfortable and take part easily in science and technology based education. They should be given support to develop an academic and professional career and fulfill their potential. From a very early age, interest in STEM should be encouraged by schools focusing on subjects that are crucial to the foundations of STEM like math and science. Parents must be encouraged to become advocates in the school system for their young daughters who show interest in STEM education. Teachers must be trained to recognize interest and be advocates for the inclusion of young women who show interest or potential in the STEM field. Women's campaigns should create an opportunity where women and girls can find STEM role models and mentors who will share career and educational advice to inspire young girls to expand their horizons, improve their academic performance and to dream big about their future. Structured extracurricular activities (school clubs, camps, and field trips) can be offered across the country from primary to higher education levels to strengthen girls' engagement and interest in STEM. Companies and organizations should offer internship and job shadowing programs for girls and women to learn more about different possibilities in the STEM fields. Government policies should encourage scientific organizations to create standing committees on women in science and technology to increase the percentage of women in these fields. Policymakers should implement policies that support the role of women in science and technology.

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The Impact of Foreign Exchange Reserve and Remittances on Investment in Bangladesh: An Econometric Enquiry

Submission: 23-10-2018
Acceptance: 10-03-2022

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Abstract: *This study examines the impact of foreign exchange reserves and remittances on investment growth in Bangladesh. The study period for this research is from 1982 to 2017. The Augmented Dickey-Fuller (ADF) test and Johansen Juselius cointegration technique are employed to test the time series properties and the long-run relationship among the variables. Furthermore, the study uses the unrestricted Vector Autoregressive (VAR) Model to examine the short-run causal effects and the long-run response of investment for changes in foreign exchange reserve and remittance. Results of the VAR Granger causality test confirm the positive effect of foreign exchange reserve while do not find any causal effects of remittance on the investment growth in the short run. Moreover, results of impulse response function substantiate positive future response of investment due to shock imposed on both foreign exchange reserve and remittance. By contrast, according to the result of variance decomposition function, investment is mainly caused by its shock in the short run, however, in the long run, compared to remittance, a shock to foreign exchange reserve is found a greater positive impact on the future response of investment in Bangladesh.*

Keywords: Cointegration, Foreign Exchange Reserve, Investment, Remittance, VAR Model

1. Introduction

Remittance and foreign exchange reserves have become significant contributors to the economy of Bangladesh. These two macroeconomic variables are showing an encouraging trend in their growth pattern over the years. According to the statistical appendix of Bangladesh Economic Review (2017), the foreign exchange reserve mounted at \$33.41 billion and the inflow of remittance was \$13 billion in 2017. Theoretically, as many studies show, both remittance and foreign exchange have multiple routes to contribute to the economic development of a country. For example, the inflow of remittance improves the quality of life for the recipient country by alleviating poverty. Likewise, the allocation of high foreign exchange reserves also has multidimensional uses ranging from the payment of emergency import bills to liquidity risk management in case of both internal and external liquidity shocks. On the other hand, many theoretical and empirical studies show ambiguity about the contribution of foreign exchange reserve and remittance to the acceleration of investment growth, particularly in poor developing countries. For example, while the seminal works by Dzansi (2013), Uddin (2016) and Javid (2017) find a positive relationship between remittances and investment, the works by Karapetyan and Harutyunyan (2013) find a negative impact of remittances on economic growth. However, the contribution of foreign exchange reserves also shows diversified results in many studies. For instance, Kruskovic and Maricic (2014) and Akpan (2016) find positive effects of reserve accumulation for investment and economic

stability. On the other hand, Reinhart et al. (2016) find a negative relationship between foreign exchange reserve and investment in Asian countries. It is in this backdrop, the main objective of this article is to examine the impact of foreign exchange reserve and remittance on the investment growth in Bangladesh.

Theoretically, the high remittance and foreign exchange reserve should have positive effects on the acceleration of investment. Despite remittances being primarily used for the payment of loans and the consumption of food and luxury commodities in developing countries, eventually, they might turn to be an important source for a much-needed investment fund. As stated by Richard et al. (2013) the remittance-receiving households in Ghana spend remittances either disproportionately on consumption or productive sectors like health and education. However, the accumulation of foreign exchange reserves can also help the government or private investor to provide sufficient funds to invest in capital needy developing countries. Moreover, the basic roles of high foreign exchange reserve like the stabilization of exchange rate, raising the competitiveness in international trade, and improving the current account balance can also have a significant influence over speeding up the investment performance in the host country. Paradoxically, in Bangladesh, against the phenomenal growth of foreign exchange reserve and remittance, as statistics in Table 1.1 depict, the investment scenario does not show any encouraging trend.

Table 1.1 Trends of Investment, Remittance and Foreign Exchange Reserve in Bangladesh

Year	Total Investment (% of GDP)	Remittance (in million us dollar)	Foreign Exchange Reserve (in million us dollar)
1982	17.8	418	121
1985	16.3	442	395
1990	17.1	758	520
1995	19.0	1198	3030
2000	23.0	1949	1602
2005	24.5	3848	2930
2010	26.23	10987	10750
2015	28.97	15317	25020
2017	30.5	12769	33407

Source: 1) Bangladesh Economy: Recent Macroeconomic Trend, Ministry of Finance

2) Bangladesh Economic Review, Statistical Appendix, (Various Issues), Ministry of Finance

Given this context, the main objective of this paper is to empirically investigate the impact of foreign exchange reserves and remittance on investment performance in Bangladesh. In doing so, the paper uses the unrestricted Vector Auto-Regressive (VAR) model to find the result. The Granger causality test under the VAR framework is used to find the short-run causal effects among the variables. On the other hand, the impulse response function and variance decomposition function are used to estimate the response of investment due to the imposition of external shock to remittance and foreign exchange reserve for both in the short run and long run.

The rest of the sections of the paper are organized as follows. Section two reviews the major literature. Section three provides the theoretical framework of the study. Section four discusses the data and methodology of the study. Section five reflects the empirical result of the paper. Finally, section six concludes with some policy recommendations.

2. Literature Review

While few in the case of Bangladesh, there are ample empirical studies throughout the globe about the impact of remittance and foreign exchange reserve on investment or economic growth. The seminal works by Javaid (2017), Yasmeen et al. (2011), and Jebran (2016) study the effects of remittances on investment, consumption and economic growth in Pakistan's economy. Javaid (2017) and Yasmeen et al. (2011) explore the impact of remittances on consumption and investment in Pakistan. They use a regression model to estimate the result and find positive effects of remittances on consumption and investment in the Pakistan economy. Jebran (2016) investigates the effects of remittances on economic growth in Pakistan. By using ARDL bound testing approach, they find a positive impact of remittances on economic growth in both the short-run and long run. Incaltarau and Maha (2012) also study the impact of remittance on investment and consumption in Romania. They find a significant positive effect of remittance on investment compared to consumption. Dzansi (2013) examines the impact of remittance on investment in 179 developing countries by using the panel data estimation technique for the period 1995 to 2005. He finds a positive effect of remittances on investment level in developing countries under sound institutions and a well-developed financial sector. Similarly, Khan et al. (2017) also find positive effects of remittances on private investment in South Asian countries for the period 1990 to 2014. They employ a panel autoregressive distributive lag model to estimate the result.

Many theoretical and empirical types of research also explore the effects of foreign exchange reserves on the economic development of different countries. For example, Akpan (2016) and Emmanuel (2013) examine the impact of foreign exchange reserves on the macroeconomic environment in Nigeria. Akpan (2016) investigates the impact of foreign exchange reserve on seven macroeconomic variables like inflation, exchange rate, investment, unemployment, external debt and total trade. He finds a positive impact of reserve on investment and also concluded that a foreign exchange reserve is a necessary tool for macroeconomic stability in Nigeria. Emmanuel (2013) also finds a positive relationship between foreign exchange reserve, exchange rate and economic growth in the Nigerian economy. Another Nigerian study by Osigwe et al. (2015) shows the positive impact of foreign exchange reserve on the foreign direct investment and exchange rate. By using the granger causality test, they find bi-directional causality between foreign direct investment and foreign exchange reserve and unidirectional causality from exchange rate to foreign exchange reserve.

On the other hand, Ibrahim (2011), explores the impact of external reserve on investment, inflation and exchange rate and finds negative effects of external reserve on investment in the Nigerian economy. Khan et al. (2015), however, explore the relationship

between foreign exchange reserve, energy resource and economic growth in Pakistan's economy. In their study, the error correction model shows the positive correlation between foreign exchange reserve and economic growth both in the short run and long run.

In Bangladesh, however, the literature about the effects of foreign exchange reserve and remittance especially on investment is very limited. Rather than an investment, in most cases, foreign exchange reserve and remittance are dealt with other macroeconomic variables like economic growth, consumption, or exchange rate. In qualitative research, Barai (2012) explores the impact of remittances on the development dynamics in Bangladesh. He shows that remittances not only increase investment activities, it also contributes to the improvement of social and economic indicators like nutrition, living condition, housing, education, security, health care and poverty reduction. Likewise, Islam (2009) has explored the causes of high reserve in Bangladesh. He highlights investment droughts as one of the causes for building foreign exchange reserves in Bangladesh. He explains the undeveloped financial system and difficulties in channeling national savings into investment as investment constraints in Bangladesh. On the other hand, Mostafa and Anwar (2017) investigate the effects of remittances and FDI on the economic growth in Bangladesh. By applying the OLS method, they find positive effects of remittances and FDI on the economic growth in Bangladesh.

In the same vein, Chowdhury et al. (2014) identify the core determinants of foreign exchange reserves in Bangladesh. By using the Engel Granger-based cointegration technique they find a strong relationship between foreign exchange reserve and per capita GDP, remittances, broad money and exchange rate in Bangladesh. Rahman and Banerjee (2017) study the effects of foreign exchange reserves on industrial output in Bangladesh. They use the vector error correction model to estimate the effects and find a moderate pace of adjustment between the

Foreign reserve and industrial output growth in the long-run equilibrium. Moreover, Pradhan and Khan (2015) examine the role of remittances on the quality of life in Bangladesh. They employ a vector error correction model and find long-run causality from remittances to Human Development Index (HDI). On the other hand, by exploring the impact of remittances on per capita GDP, Hasan and Shakur (2017) find a non-linear effect of remittances on per capita GDP in Bangladesh.

The studies mentioned above have mainly explored the aspects of foreign exchange reserve and remittances that can affect the state of economic growth, consumption and the movement of exchange rate for some African and other developing countries. However, there has not given much attention on physical investment particularly for industrialization and infrastructure development. Furthermore, despite the foreign exchange reserve and remittances can play a significant role in promoting environment-friendly production in achieving Sustainable Development Goals (SDGs), the researchers have overlooked to explore their relationship which is a serious research gap in studying foreign exchange reserve and remittances particularly for Bangladesh.

3. Theoretical Framework

Many schools of thought relating to economic policies discuss the role of remittances and

foreign exchange reserves on investment growth. As stated by Khan et al. (2017), the Classical Developmentalist Optimism theory of the 1950-60s and Pessimistic theory developed in 1970-80 have addressed the role of migrant remittances on investment and economic development. According to the Classical Optimism theory, the large-scale capita transfer from abroad commonly known as remittances accelerates investment capital to poor developing countries and thereby leads their economies towards fast economic development. On the other hand, according to the Pessimistic theory, as stated by Khan et al. (2017), remittances is detrimental to economic growth as it increases unproductive investment and excessive consumption expenditure.

However, the role of foreign exchange reserve to investment growth is better explained by the international financial integration theory. According to Emmanuel (2013), the theory tells that the accumulation of foreign reserves would increase the investment level as it creates the accessibility of foreign capital. The Keynesian school of thought, as said by Emmanuel (2013), also suggests that the foreign reserve improves the current account and impacts positively on the acceleration of aggregate input.

Moreover, this study is also encouraged by some eminent growth theories like classical growth theory, exogenous growth theory and Harrod Domar model in which capital accumulation is termed as an engine for investment growth no matter whether the capital is accumulated through remittances, reserves, or through any other sources.

4. Data & Methodology

Data

This study uses time-series data of the variables such as investment (INV), Remittances (REM) and Foreign Exchange Reserve (FR) in Bangladesh for the period 1982 to 2017. The data set used in this research is secondary and is collected from different sources. The data of investment as a percentage of GDP is collected from "Bangladesh Economy Recent Macroeconomic Trends and Statistical Appendix, Economic Review", Ministry of Finance of Bangladesh. The data of other variables like remittances (in million US dollars) foreign exchange reserves (in million US dollars) are collected from "Statistical Appendix, Bangladesh Economic Review", Ministry of Finance. It needs to mention here that for some statistical advantages all three series have been transformed into natural logarithm form.

Unit Root and Cointegration Test

The test of stationary and cointegration of time series data is important as it determines the appropriate econometric model for the research. For example, the different time series models like the restricted VAR model, unrestricted VAR model, or ARDL model, etc. require different necessities in terms of stationary and cointegration tests. Despite there being many techniques for unit root test and cointegration test, this paper uses Augmented Dickey-Fuller (1979) for unit root test and Johansen (1988) and Johansen and Juselius (1990) cointegration technique for cointegration test. Dickey and Fuller (1979) have developed the following equation to check the unit root of the time series.

$$\Delta Y_t = \alpha_1 + \alpha_2 t + \rho Y_{t-1} + \beta_i \sum_{i=1}^m \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

In the equation Δ denotes the first difference, ε_t is white noise error term with zero mean and constant variance and m denote the number of lags. The null hypothesis $H_0: \alpha_2 = 0$ indicates that the time series has a unit root. Hence the rejection of the null hypothesis implies the time series is stationary.

On the other hand, a cointegration test is done to check the long-run relationship among variables. For this research, the method developed by Johansen (1988) and Johansen and Juselius (1990) is adopted for the cointegration test. In this method, the two test statistics namely the Trace test and Maximum Eigen-value test are used to estimate the number of cointegrating vectors. The two equations of Trace and Maximum Eigen-value test specifies as follows

$$\lambda_{\text{trace}(r)} = T \sum_{i=r+1}^k \ln(1 - \lambda_i) \quad (2)$$

$$\lambda_{\text{max}(r, r+1)} = -T \ln(1 - \lambda_{r+1}) \quad (3)$$

Here, T is the number of observations and λ_i is the i^{th} largest canonical correlation. In equation 2, $\lambda_{\text{trace}(r)}$ examines the null hypothesis of at most r cointegrating vectors against the alternative hypothesis of at least 1 cointegrating vector. Moreover, in equation 3, $\lambda_{\text{max}(r, r+1)}$ represents the null hypothesis of r cointegrating vectors in opposition to the alternative hypothesis of $r+1$ cointegrating vectors.

The Unrestricted VAR Model

The unrestricted VAR model generally explores the dynamic linear relationship among the variables in multiple time series. In a VAR model, the K variable is a linear function of its lags, the lags of $K-1$ variables and also the lags of other independent variables. The model considers all the time series under consideration as endogenous variables and hence produces equations equal to the total number of variables. The general formula of VAR can be specified as follows

$$Y_t = a_0 + \sum_{i=1}^k \beta Y_{t-i} + \varepsilon_t \quad (4)$$

Where Y_t is the vector of dependent variables, β represents a vector of intercepts and ε_t is the white noise error term which is independently and identically distributed. As this study includes three variables where investment (INV) is the dependent variable and remittance (REM) and foreign exchange reserve (FR) are independent variables, the VAR model will produce three equations in which all the variables appear as endogenous respectively. In the following equations, the linear relationship between the variables can be examined by the significant values of coefficients.

$$\text{INV}_{t,1} = \alpha_1 + \beta_{11} \text{INV}_{t-1,1} + \beta_{12} \text{REM}_{t-1,2} + \beta_{13} \text{FR}_{t-1,3} + \varepsilon_{t,1} \quad (5)$$

$$\text{REMT}_{t,2} = \alpha_2 + \beta_{21} \text{INV}_{t-1,1} + \beta_{22} \text{REM}_{t-1,2} + \beta_{23} \text{FR}_{t-1,3} + \varepsilon_{t,2} \quad (6)$$

$$\text{FR}_{t,3} = \alpha_3 + \beta_{31} \text{INV}_{t-1,1} + \beta_{32} \text{REM}_{t-1,2} + \beta_{33} \text{FR}_{t-1,3} + \varepsilon_{t,3} \quad (7)$$

However, the VAR model as stated above can not specify the direction of causality among the three variables. Hence, under the VAR approach, to find the direction of

causality among the variables, the VAR Granger Causality test has to be used. The following equations specify the VAR Granger Causality test:

$$INV_t = \alpha_0 + \sum_{t-i}^m \alpha_{1i} INV_{t-i} + \sum_{t-i}^n \alpha_{2i} REM_{t-i} + \sum_{t-i}^n \alpha_{3i} FR_{t-i} + \alpha_4 ECT_{t-i} + \eta_t \quad (8)$$

$$REM_t = \gamma_0 + \sum_{t-i}^m \beta_{1i} INV_{t-i} + \sum_{t-i}^n \beta_{2i} REM_{t-i} + \sum_{t-i}^n \beta_{3i} FR_{t-i} + \beta_4 ECT_{t-i} + \phi_t \quad (9)$$

$$FR_t = \Psi_0 + \sum_{t-i}^m \psi_{1i} INV_{t-i} + \sum_{t-i}^n \psi_{2i} REM_{t-i} + \sum_{t-i}^n \psi_{3i} FR_{t-i} + \Psi_4 ECT_{t-i} + \varepsilon_t \quad (10)$$

Here, α_0 , γ_0 and Ψ_0 are the respective intercepts, ECT_{t-1} is error correction terms at the different intercepts and η_t , ϕ_t and ε_t are the white noise error terms with constant variance and zero means. In equation 8, if the null hypothesis of $\alpha_{2i} = \alpha_{3i} = 0$ is rejected, it implies that both remittances and foreign exchange reserves will cause investment in the short run. If $\alpha_{2i} \neq 0$ when $\alpha_{3i} = 0$, would imply causality from remittances to investment, on the other hand, $\alpha_{2i} = \alpha_{3i} = 0$ would imply no causality running from remittances and foreign exchange reserve to investment. The causality analysis in Equations 9 and 10 can also be interpreted in a similar pattern.

5. Empirical Results

This paper uses time-series data which requires an econometric model for quantitative analysis. According to the econometric wisdom, as the usage of different models has different requirements in terms of unit root and cointegration test, the paper adopted the Augmented Dickey-Fuller unit root test and Johansen Juselius cointegration test to select the appropriate model. Before the test, the paper also needs to select optimal lag and at the same time, the time series should be uncorrelated and normally distributed. Hence, the paper also includes lag selection criteria and diagnostic tests of time series data.

Table 2. Unit root test (ADF) for the time of 1982 to 2015

Intercept				
Series at Level			First Difference	
Variables	Test Statistic	Probability	Test Statistics	Probability
Ln ti	-0.335529 (3) **	0.9085	-5.244971 (0) **	0.0001
Ln rem	-0.445841 (0) **	0.8900	-5.888702(0) **	0.0000
Ln fr	-0.028658 (1)	0.9493	-5.683001 (0) **	0.0000

With Trend and Intercept				
Series at Level			First Difference	
Variables	Test Statistic	Probability	Test Statistics	Probability
Ln ti	-2.000597 (2)**	0.5796	-5.278567(0) **	0.0007
Ln rem	-1.587662 (0)**	0.7775	-5.848556(0) **	0.0002
Ln fr	-2.108618 (1)**	0.5228	-3.207094 (0) **	0.0003

Source: Author's calculation by Eviews version 2010

Note i) ** indicates significance at the 5% level.

ii) Figures in the parentheses represent the optimal lag length

The Augmented Dickey-Fuller unit root test has been done with both intercepts and with trend and intercept of the time series. In both cases, as the result in table-II suggests that the three variables like Lnti, Lnrem and Lnfr are non-stationary at levels because the null hypothesis cannot be rejected at a 5% level of significance. However, at the first difference of the variables, as the result shows, all the time series became stationary because the null hypothesis is now rejected at a 5% level of significance. Hence, the unit root test says all the variables are integrated of order 1.

Table 3. Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-19.79096	NA	0.000834	1.424435	1.561848	1.469984
1	115.9750	237.5904*	3.03e-07*	-6.498435*	-5.948784*	-6.316241*
2	117.8605	2.946227	4.82e-07	-6.053784	-5.091895	-5.734945
3	125.9735	11.15536	5.32e-07	-5.998346	-4.624218	-5.542862
4	135.0190	10.74115	5.77e-07	-6.001190	-4.214824	-5.409060

Source: Author's calculation by Eviews version, 2010

*indicates lag order selection by criteria

LR: Sequential modified LR test statistic (each test at 5% level), FPE: Final Prediction Error, AIC: Akaike Information Criterion, SIC: Schwarz Information Criterion, HQ: Hannan-Quinn Information Criterion.

The lag selection criterion depicted in table-III shows the different values for different criteria. According to the theory, the optimal lag is determined in terms of the lowest possible value for Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) Final Prediction Error (FPE) and Hannan-Quinn method. The researcher can choose any of the methods; however, in this time series, all of the criteria suggest lag order 1 for optimal lag length. Hence, the optimal lag length for this research is 1 which is suggested by all methods.

Table 4. Diagnostic Testing

Tests	Values	Probability
Residual Serial Correlation LM Test	F-stat = 0.84696	0.5766
Residual Heteroscedasticity test	Chi-square = 46.92155	0.1051
Normality Test (Cholesky co variance)	Jerque Bera = 10.37679	0.1097

Source: Author's calculation by Eviews version, 2010

The diagnostic test of the unrestricted VAR model is used to check the robustness of the model. The study includes residual serial correlation LM test, residual heteroscedasticity test and Cholesky co-variance normality test as for diagnostic testing. The result depicted in table IV shows that the probability values in all three checks are more than 5% which indicates the not rejection of null hypothesis at 5% critical values. The not rejection of the null hypothesis confirms the robustness of the model as there is no serial correlation, no heteroscedasticity and multivariate normal distribution of the model.

After the unit root test, the research needs to check the number of cointegrating vectors. In doing so, the paper uses the Johansen cointegration test and the result of the cointegration test is specified as follows:

Table 5. Johansen Juselius co integration test

Null Hypothesis	Trace Statistics	Critical Values		Max Statistics	Critical Values	
		5 Percent	Probability		5 Percent	Probability
None	18.51335	29.7907	0.5283	14.71988	21.13162	0.3090
At most 1	3.793472	15.49471	0.9195	3.549420	14.26460	0.9036
At most 2	0.244052	3.841466	0.6213	0.244052	3.841466	0.6213

Source: Author's calculation by Eviews version, 2010

Note- i): Test assumption includes linear deterministic trend in the series

ii): Optimal lag is 1 determined by Akaike Information Criteria (AIC)

ii): ** indicates significance at the 5% level

As per the results of the Johansen Juselius cointegration test, the Trace statistics can not reject the null hypothesis of no cointegrating vectors $r = 0$, while rejecting the alternative hypothesis of at most one cointegrating vectors $r = 1$. Similarly, in Max statistics, the null hypothesis of no cointegrating vectors is not rejected. Against this backdrop, according to the result of Johansen Juselius's cointegration result, there exists no cointegration among the variables, i.e. there is no long-run stable relationship among investment, remittances and foreign exchange reserve in Bangladesh.

Table 6. VAR Granger Causality test

Null Hypothesis	Value of Chi-Square	Probability	Inference
REM does not Granger cause TI	2.232365	0.1351	Does not reject H_0
FR does not Granger cause TI	13.41218	0.0002	Reject H_0
Joint Causality	16.73502	0.0002	Reject H_0
TI does not Granger cause REM	2.854443	0.911	Does not reject H_0
FR does not Granger cause REM	2.521916	0.1123	Does not reject H_0
Joint Causality	7.844644	0.0198	Reject H_0
TI does not Granger cause FR	0.229894	0.6316	Does not reject H_0
REM does not Granger cause FR	4.177297	0.0410	Does not reject H_0
Joint Causality	9.645710	0.0080	Reject H_0

Source: Author's calculation by Eviews version, 2010

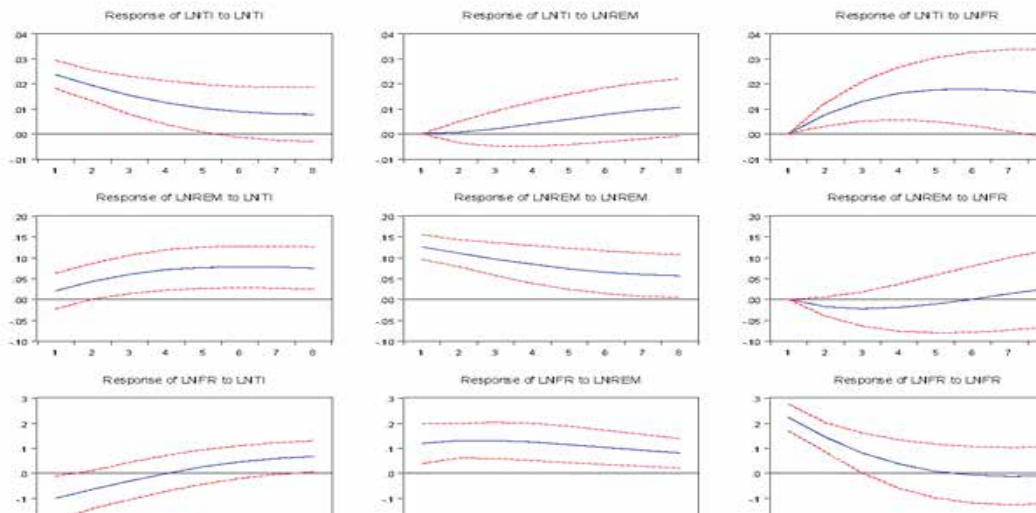
The result of the VAR Granger causality test is depicted in table VI. According to the result, remittances do not have any impact on investment level in the short run as the probability value, depicted in table VI, does not imply any causal relationship between remittances and investment in Bangladesh. The foreign exchange reserve, on the other hand, has a positive impact on the investment as the probability value 0.0002 rejects the

null hypothesis of FR does not Granger cause TI. However, as the results show, the joint effects of remittances and foreign exchange on investment level are positive as a joint probability of 0.0002 implies that both remittances and foreign exchange reserve can jointly cause investment in Bangladesh. We also see that total investment and foreign exchange reserve do not Granger cause remittances in Bangladesh in the short run. On the other hand, remittances are found unidirectional causal effects on foreign exchange reserves in Bangladesh.

The Impulse Response Function

The impulse response function shows the future change of X for 1 unit standard deviation shock to Y by residuals in time t. The future response of X might also be for 1 unit standard deviation shock by itself in time t. However, as the paper examines the impact of remittances and foreign exchange reserve on the investment level, the paper would mainly shed light on the future response of investment due to standard deviation shock to remittances and foreign exchange reserve. The impulse response function of three logged variables like LNINV, LNREM and LNFR can be found as follows:

Figure 1. Impulse Response Function



Source: Author's calculation by Eviews version 2010

The above Figures present the results of estimated impulse response functions (IRFs) for the considered variables. At first, it needs to mention that the functions are stable as the blue lines are within the two red lines. In the figure, the response of LNINV to LNREM shows a positive response of investment for a one standard deviation shock to remittances because the blue lines remain above zero lines and upward until the next eight years. More specifically, a shock to remittances impacts positively on investment toward the next eight years. Similarly, the response of LNINV to LNFR which is depicted at top of the third column also shows the positive response of investment for one standard deviation shock to foreign exchange reserve.

Variance Decomposition Analysis

The variance decomposition is designed to measure the percentage forecast error variance of endogenous variables. More specifically, it explains the percentage fluctuation in the variance of endogenous variables in the future for a unit shock implied to each of the exogenous variables and itself. However, the main difference of variance decomposition technique with impulse response function is their mood of forecasting explanation. While the variance decomposition function forecasts percentage fluctuation in the variance of a dependent variable, the impulse response function forecasts positive and negative impacts on dependent variables in terms of zero lines. Nevertheless, the results of the variance decomposition function are depicted in the following Table

Table 7. Variance Decomposition Analysis

Dependent variables	Forecast Time Horizon	Forecast Standard Deviation	Percentage Variance Decomposition		
			LNTI	LNREM	LNFR
LN TI	1	0.023675	100.00	0.000000	0.000000
	3	0.037393	83.50959	0.326779	16.16363
	10	0.066665	39.53465	13.37709	47.08827
LNREM	1	0.126490	2.413375	97.58662	0.000000
	3	0.209200	13.21823	84.82516	1.956612
	10	0.340084	38.04305	57.18811	4.768846
LNFR	1	0.271067	13.87277	18.97163	67.15560
	3	0.373588	11.14990	34.28572	54.56439
	10	0.474874	16.36705	49.09864	34.53431

Source: Author's calculation by Eviews version, 2010

According to the results depicted in Table 7, in the short run, the variation in investment is mainly caused by its shock. In periods 1 and 3, the investment fluctuates 100 percent and 85.51 percent respectively by its shock, on other hand, the shock to other variables like LNREM and LNFR does not cause any remarkable variation in the investment in the short run. However, the case is different in the long run. A shock to foreign exchange reserve has a greater impact on investment growth in the long run. According to the results depicted in table-VII, a shock to foreign exchange reserve contributes 47.09 percent variation in investment while its shock contributes 39.53 percent, on the other hand, a shock to remittance accounts for 13.37 percent contribution in the fluctuation of investment in the long run.

6. Conclusion & Policy Recommendations

In recent years Bangladesh has made some significant improvements in achieving high remittance inflow and in mounting its foreign exchange reserve. Hence, the remittance and foreign exchange reserve became leading contributors to Bangladesh's economy. On the other hand, the country lags in accelerating its investment scenario as it is hovering around 25 to 30 percent during the last decade. Given this context, this paper has made an

investigation to find the effects of remittance and foreign exchange reserve on investment in Bangladesh.

However, the results have come out with some strong features. For example, remittance, as the result shows, does not have any significant impact on investment growth in Bangladesh both in the short-run and in long run. This finding is a serious concern to the policy sector in Bangladesh as high remittance inflow might increase the inflation rate and create income inequality in the economy if it is not spent for investment. Given this context, the paper recommends prudent policies that would emphasize the utilization of remittances mainly to increase investment growth.

On the other hand, the paper found a positive impact of foreign exchange reserve on investment both in the short run and long run. Hence, despite foreign exchange reserves having multidimensional investment opportunities, the paper suggests the government use its high foreign exchange reserve mainly to increase physical investment particularly for industrialization and infrastructure development in Bangladesh.

Furthermore, the authorities can invest excess foreign reserves into the Exchange-Traded Funds (ETF) to diversify and get better returns from the foreign exchange reserves. ETF is a kind of investment fund which is generally dealt with financial assets and stock exchanges. Some ongoing development projects such as green initiatives, promoting women empowerment, export promotion activities, etc. can also be some viable sources of returns for the excess foreign exchange reserves in Bangladesh.

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Economic Growth and Environmental Degradation in Bangladesh: An ARDL Bound Testing Approach to Co-integration and Dynamic Causality Analysis

Submission: 18-03-2019
Acceptance: 31-03-2022

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Abstract: *This study is an attempt to investigate the association between economic growth and environmental degradation, the Environmental Kuznets Curve (EKC), over the period of 1972-2014 in Bangladesh. The Autoregressive distributed lag (ARDL) bounds testing approach to co-integration has been undertaken for long-run relationships, and Vector Error Correction Model (VECM) has been applied for the short-run Granger causality analysis. Except trade openness, all variables carry the expected signs and are found to be co-integrated. The study found that energy consumption and urbanization may be considered as the prime factors contributing to Carbon dioxide (CO₂) emission largely in the long-run and also found an inverted U-shaped relationship between CO₂ emission and growth both in the short-run and in the long-run. In this paper short run bidirectional causality from urbanization to economic growth and trade openness to economic growth has been observed, while unidirectional causality is found from urbanization to energy consumption and CO₂ emission to urbanization. By using sensitivity analysis, it is found that there exhibits no autocorrelation and multicollinearity among the series.*

Keywords: EKC, ARDL, VECM, CO₂, Bangladesh

1. Introduction

Climate has been changing rapidly, largely due to rising world temperature that adversely impacts the planet earth. Carbon emission is one of the primary factors for increasing world temperature that comes from the developing economies due to industrialization which contributes to rapid economic growth (Asante, 2016). Economic growth (EG) through industrial sector development increases both income and welfare in an economy that causes environmental degradation (Ahmed & Long, 2012).

Global warming is an outcome of environmental degradation. The world's average temperature has increased gradually because of the emission of greenhouse gases mainly CH₄, CO and CO₂. If the trends of current global emissions are not curbed, they will vary between 3.7°C and 4.8°C by 2100 (Lucas, Wheeler & Hettige, 1992). Observing the situation of carbon emission, the Kyoto protocol agreement connected to the United Nations framework convention on climate change promises to set binding carbon emission reduction targets internationally that lead to reducing environmental degradation.

On the other hand, environmental degradation is considered a barrier to economic development. Hence, concerned countries have already initiated the usages of green

energy to reduce global warming. That's why a question has been raised-how EG may be linked with the environment as both it rises through prompt industrialization and growing environmental consciousness (Dinda, 2004).

Kuznets (1955) proposed an inverted U-shaped Environmental Kuznets curve (EKC) which demonstrates the association between income and income inequality. Then the EKC was found showing a correlation between degradation of the environment and EG which also depicts that environmental degradation escalates with EG at the initial stage, and thereafter it starts to decline.

The eminent researchers, for instance, Grossman and Krueger (1991, 1995), Lucas et. al. (1992), Shafik and Bandyopadhyay (1992), Selden and Song (1994), Vincent (1996) and Panayotou (1997) adopted EKC in the literature of environmental economics in the decade of 1990 and found a reversed U-shaped association between pollution and income in case of numerous pollutants.

The EKC has been examined practically over the past two decades and numerous statistical tests have also been applied to it by using time series and panel data techniques not only associated with a group of countries but also individual country and cross-country data too. Nevertheless, it is suggested that with the purpose of obtaining improved outcomes and consequences, the analysis of individual countries is a more appropriate choice since nations can vary in case of location, size and, more specifically, economic characteristics. It has also been claimed that EKC demonstrates the association between pollution and other variables of environmental degradation with time (Ahmed & Long, 2012). Thus, it is supposed that the EKC is a long-run (LR) phenomenon (Lindmark, 2002).

Moreover, Bangladesh is a highly disaster-prone area characterized by large population density and low natural resources though it experienced a 7.2% economic growth rate in 2017 (Ministry of Finance, 2018). Agricultural contribution to GDP has declined while thanking industrialization and the service sector for the continuous growth rate. Moreover, huge population pressure, poverty, industrialization, and rapid urbanization, especially in coastal areas contribute to environmental degradation.

Besides these, due to the absence of awareness, people have directly influenced environmental degradation. For example, they are cutting down trees indiscriminately resulting in desertification (Prathibha, 2016). As a result, severe socio-economic and environmental damage are increasing due to natural calamities, for example, inefficient rainfall, cyclones, floods, and tidal bores.

The government of Bangladesh adopted the National Conservation Strategy, National Environmental Policy, and the National Environmental Management Action Plan for protecting the natural resources and the environment (Fazle, 2015). The economy of Bangladesh stumbles toward achieving balanced environmental development in spite of achieving impressive growth.

The EKC, however, demonstrates the association between environmental degradation and EG which also depicts that environmental degradation increases with EG. It also shows that EG could be coherent with the betterment of the environment if appropriate strategies are taken.

The objective of this paper is to examine empirically the rationality of the EKC in the case of Bangladesh by applying time series data for carbon dioxide emissions and gross domestic product per capita between 1972 and 2014. The rationale for selecting Bangladesh is that it has made abundant achievements recently in terms of economic growth since its independence in 1971 and has already implemented a wide range of programs and policy initiatives that incorporate macroeconomic determinants and tackle the environmental challenges it faces. The relationships of urbanization, trade openness, energy consumption, and EG to the emissions of CO₂ have been helped to a larger extent in case of reduction in CO₂ emissions targets by 2012 specified under the Kyoto Protocol.

However, this paper discusses the nature of the association between EG and environmental degradation and also revisits -Does an inverted "U"- shaped EKC exist in Bangladesh?

The structure of the paper is prepared as follows. Section 2 provides the literature review on EKC whereas section 3 analyzes the theoretical concepts of the EKC. Thereafter, section 4 presents the status of the variables from Bangladesh perspective followed by economic and econometric issues relating to EKC and section 5 explains the methodology and data used in the analysis and then discusses the study findings. The final section of the paper, section 6, contains conclusions and policy implications.

2. Literature Review

Kuznets curve, introduced by Simon Kuznets in 1955, argued that in the initial phases of EG the income equality will tend to worsen and merely at lower stages it will increase (Todaro & Smith, 2014). These observations bear out the characteristics of the "inverted - U" Kuznets curve (Kuznets, 1955).

The EKC curve holds on a new existence in the 1990s showing the environmental embezzlement level and per capita income followed the similar reversed U-shaped association which is called the environmental Kuznets curve. Kuznets did not give off the mechanism by which his Inverted-U hypothesis was determined to happen, it could be the consecutive procedure to economic development consistently.

As stated by Beckerman (1992) the EKC's policy implication is that "promoting economic growth are sufficient criteria to safeguard the environment. In the long run, the surest way to improve the environment is to become rich."

The development report of the World Bank (World Bank, 1992) points out that "environmental policies which protects nature and promotes economic development could slow the pollution of the environment." It also argued that the environment inescapably hurts due to greater economic activity which relies on presumptions about

tastes, environmental investments and technology. This report also supplements, "As incomes rise, the demand for improvements in environmental quality will increase, as will the resources available for investment".

In addition, a non-linear association has been found by Jalil and Mahmud (2009) between the two time periods and supports in favor of EKC in China. A time series data between 1991 and 2006 has been used by Zhang and Cheng (2009) and found that increased economic activity leads to higher CO₂ emissions while improvement in energy intensity does the reverse and it also found that agriculture sector development has had an affirmative impact on the emission of CO₂ for China. Dhakal (2009) found that CO₂ emissions increased in order to increase per capita income.

Several industries and firms contributing to rapid EG lead to an upsurge in the demand for higher electricity consumption. The higher electricity consumption, used as a proxy variable of energy consumption, contributes most to environmental degradation. Hence, the correlation between energy consumption and EG is measured as one of the prime determinants of carbon emission. Several studies in this perspective include Yang (2000); Glasure (2002); Ghali, El-Sakka, and M.I.T., (2004); Narayan and Singh (2007); Narayan, Narayan, and Prasad (2008); Jalil and Mahmud (2009), Halicioglu (2009); Narayan and Narayan (2010), Apergis and Payne (2010); Ozturk and Acaravci (2010), and Shahbaz, Dube, Ozturk, and Jalil (2015).

After determining the EG and energy consumption as the primary factor, trade openness is one of the following important patrons to the degradation of the environment. The association between international trade and the environment has been experimentally justified but their effect relies largely on the strategies undertaken within the nation's economy. The studies found that international trade influenced negatively the environment such as Schmalensee, Stoker and Judson (1998), Suri and Chapman (1998); Beghin, Bowland, Dessus, Roland-Holst and D.V (1999), Abler, Rodriguez and Shortle (1999), Lopez (1994); Cole, Elliott, and Azhar (2000) and Antweiler, Copeland, & Taylor (2001); Copeland and Taylor (2001); Chaudhuri and Pfaff, (2002); Ozturk and Acaravci (2010) and Nasir and Rehman (2011). Moreover, it has also been found that the environmental degradation declines after a certain level of growth. Nevertheless, Lucas(1992), Wheeler and Hettige (1992) and Shafik and Bandyopadhyay (1992) found mixed results between the relationship of the stated variables. Hence, international trade demonstrates a primal contributor among all the variables.

In contrast, Dhakal (2009) investigates the association between CO₂ emissions and urbanization in China and found that an 18% increase in population contributes to around 40% higher CO₂ emissions.

Nasir and Rehman (2011) studied the association between energy consumption and foreign direct investment (FDI) in Portugal between 1990 and 2011. They also investigate the association among CO₂ emissions, EG, electricity consumption, and international trade in the case of Pakistan. Their outcomes support the EKC hypothesis while electricity consumption is used as a proxy variable of energy consumption and

international trade variables are supplemented with the GDP variable.

Jobert, Karanfil, and Tykhonenko (2012) conducted research on EKC for the emissions of CO₂ for income level of different nations applying Iterative Bayesian Shrinkage Procedures and found high-income countries experienced decreasing per capita CO₂ emissions while middle-income countries experienced horizontal trends and finally low income countries had increasing per capita emission.

Muhammad (2012) worked on an EKC for Bangladesh. Using time series data he found that both EG and international trade causes CO₂ emission and support the existence of EKC in Bangladesh.

Shakar (2014) analyzed examining EKC for CO₂ emission in Bangladesh: Applying the Bootstrap approach using time series data he found that every ten years the median level of CO₂ emission and variation of emission both were increasing and GDP per capita or squared GDP did not contribute significantly.

Prathibha (2016) worked on the EKC for CO₂ emission: undertaking the context of OECD and Non-OECD countries by using panel data he found that, i) EKC only exit for the non-OECD regions of Africa and Asia; ii) Latin America showing evidence for it at all; iii) OECD countries have N-shaped EKC.

From the literature review, it is found that real GDP per capita, squared of real GDP per capita, energy consumption, international trade and urbanization affect CO₂ emission. This study mostly focuses on the association among CO₂ emission, real GDP per capita and squared of real GDP per capita to check any inverted "U"- shaped association between environmental degradation and EG in Bangladesh. Hence international trade and urbanization will be used as a control variables. Some researchers have already applied these variables from a Bangladesh's perspective. This study will revisit the idea of Environmental Kuznets's Curve in Bangladesh perspective.

3. Status of Environment Condition and Economic Growth of Bangladesh.

Natural gas is one of the major suppliers of fulfilling the energy demand in the perspective of Bangladesh (Sarkar, 2015). Oil, petroleum, coal, hydro and renewable energy etc. are alternative sources of energy. Energy is mainly used for power generation. Human activities have increased the concentration of greenhouse gases markedly for power generation. Various sources like electricity, transport, manufacturing, etc. have generated emissions. The electricity generation sector followed by the manufacturing sector generates the highest emission in Bangladesh. In 2012, 47.72 percent of gas was emitted from the electricity sector in Bangladesh whereas 20.87, 11, 13, 14, 49 and 5.79 percent were from the manufacturing and construction, residential and commercial as well as public service respectively (Sarkar, Sadeka, Sikdar, & Badiuzzaman, 2015).

Bangladesh Bureau of Statistics (BBS) estimates that the contribution of the broad industry sector to GDP stands at 33.71 percent in FY 2017-18 and the contribution of the manufacturing sector to GDP is 21.74 percent (Ministry of Finance, 2018). The agricultural sector plays a vital role in the overall economic development of Bangladesh.

The agricultural sector (crops, animal farming, forests & fishing) contributes 14.10 percent to the country's GDP (Ministry of Finance, 2018).

The energy demand in Bangladesh has been increasing day by day at a significant rate. With rapid urbanization, the energy demand has increased at a substantial rate (Figure 1). In Bangladesh, electricity is the most widely used energy. Power plants normally generate the power and convert some other type of energy into electricity. Nuclear power is another kind of energy. The energy is resulting from the processes of the nuclear fuel cycle which includes mining, processing, transporting and storing fuel and radioactive fuel waste. The increasing trend of energy consumption bears out the rapid economic growth but nuclear power plant disasters the Chernobyl.

Natural gas and electricity are one of the most usable energy sources in Bangladesh. Energy produces the emission that has been mainly emitted from electricity generation. One of the most concentrating factors that have been keeping pace with the increasing trend of CO₂ emission is oil shale. It yields waste material that is detrimental to atmospheric emissions, including carbon dioxide. The use of petroleum are increasing day by day which causes CO₂ emissions rapidly in recent years (Figure 2).

In Bangladesh, Environmental degradation mainly occurs due to industrial sector activities. Very few sources of noxious exhaust gases are as large as the Iron and Steel industry (Rasul, Faisal, & Khan, 2006). Air pollution is largely generated from the burning of bagasse in the boiler and furnaces, which comprises nitrogen oxides, Sulphur dioxides. Besides, the fertilizer industry helps with environmental degradation. Aquatic life is affected by the acidic wastes which are generated from fertilizer factories.

Along with the rapid economic growth and massive population size, energy consumption is increasing which bears out the CO₂ emissions. This is alarming for Bangladesh. The government should take a mitigation policy to check the emissions. Bangladesh has been experiencing an upward trend in real GDP per capita (Figure 3). The larger portion is driven by the service sector followed by the manufacturing sector, especially exports of readymade garments, receiving remittances, and the domestic agricultural sector. Over the years, Bangladesh's telecommunication industry has witnessed rapid growth. After the independence of Bangladesh, the real GDP per capita had an increasing rate for three years but thereafter it had been decreasing and furthermore it increased at a moderate rate from the year of 1976 to 1985.

Bangladesh has achieved remarkable progress in GDP. In 2000, the GDP growth rate was 5.29 percent but in the year 2004 the GDP growth rate did not rise at a substantial rate due to political turbulence. But after 2010, there exists an increasing trend in GDP growth rate. Bangladesh has surpassed Pakistan's for achieving GDP growth rate by roughly 2.5 percentage points annually (Fazle, 2015). It is expected that the growth rate is likely to exceed India. In addition, per capita income as well as purchasing power parity is growing faster in Bangladesh due to the population growth though the rate is still lower than in Pakistan.

4. Theoretical and Conceptual Framework

Simon Kuznets, a Nobel Laureate, suggested that at the initial stage of EG, the distribution of per capita income will tend to deteriorate but at the later stage it will develop. This observation tends to be investigated by the inverted U-Kuznets curve (Todaro & Smith, 2009).

In 1995 economists Grossman and Krueger found that Kuznets curve propositions can be extended to show the association between environmental degradation and EG. They also stated that there exists an inverse association between EG and environmental degradation (Grossman & Krueger, 1995). In the initial stage of economic expansion, environmental quality tends to come off due to using natural resources and it is continuing to a certain level. After a certain point, it would be better to represent a negative relation. Figure 1 shows this relationship.

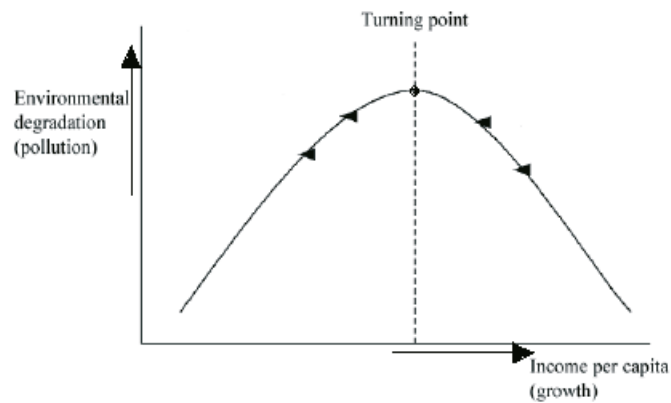


Figure 1. The Environmental Kuznets Curve (EKC)

Rising income of people leads to a higher standard of living and this tendency increases the demand for a better environment. That is why environmental degradation tends to reduce in its initial stage. From empirical studies it is clear that by achieving a higher living standards, people confer a greater value on environmental betterment (Pezzey, 1989). After achieving a certain level of income, the willingness to pay for maintaining the quality environment escalates by a larger percentage than income (Sabrina, 2006). It is represented by the income elasticity of environmental quality demand-the responsiveness of percentage changes in environmental quality demand with the percentage change in income.

Economic growth influences the environment quality in three different ways, e.g., technological effect, scale effects and composition effects which are producing more output hence there must require more input that we get from the natural environment. By continuing to do that the environment is degraded. This is known as the scale effect which has a negative environmental impact. Moreover, economic betterment has an affirmative influence on the composition effect that is for rising income people's willingness to pay for environmental quality rises (Grossman & Krueger, 1991).

Very few factors of EKC are as effective as international trade. Trade represents the increasing size of the economy resulting in environmental degradation. But many economists have claimed that trade has not always had a deleterious impact on the environment. It is debatable. However, in scale effect trade has a reverse impact on the environment but in composition effect it is positive.

4.1 Data Source

This study has used time series data annually for the period 1972-2014. The variables are carbon dioxide emission per capita (CO_2), real GDP per capita (Y), squared real GDP per capita (Y^2), energy consumption (En), trade openness (TO) and urbanization (U). CO_2 emission is measured in metric ton per capita and is used as a proxy for environmental degradation, real GDP per capita in USD is measured in constant 2010 prices and is used as a proxy for EG and the square of real GDP per capita is the simple form of the real GDP per capita, energy consumption is for energy use (kg of oil equivalent per capita), urban population (as a share of the total population) used as a proxy variable of urbanization. On the other hand, trade openness per capita can be calculated as export plus import divided by GDP. The data source for all the variables is World Development Indicators (WDI).

4.2 Model Specification

The relationship amid EG, energy consumption, international trade and urbanization on CO_2 emission is investigated by the following equation

$$CO_{2t} = f(Y_t, Y_t^2, En_t, TO_t, U_t) \quad (1)$$

To transmute this relationship into linear form and therefore, linear specification of the model into log-linear specification model providing more suitable and efficient results as compared to the simple linear functional form of model which are given below:

$$CO_{2t} = \beta_0 + \beta_1 Y_t + \beta_1^2 Y_t^2 + \beta_2 En_t + \beta_3 TO_t + \beta_4 U_t + e_t \quad (2)$$

Therefore, the log-linear form becomes:

$$\ln CO_{2t} = \beta_0 + \beta_1 \ln Y_t + \beta_1^2 \ln Y_t^2 + \beta_2 \ln En_t + \beta_3 \ln TO_t + \beta_4 \ln U_t + e_t \quad (3)$$

The following conditions show that if:

- i) $\beta_1 = \beta_1^2 = \beta_2 = \beta_3 = \beta_4 = 0$. There is no association between real GDP per capita, its square, energy and trade openness with CO_2 emission per capita.
- ii) $\beta_1 > 0$ and $\beta_1^2 = \beta_2 = \beta_3 = \beta_4 = 0$. A linear relationship between real GDP per capita and CO_2 emission.
- iii) $\beta_1 < 0$ and $\beta_1^2 = \beta_2 = \beta_3 = \beta_4 = 0$. A decreasing relationship between Y_t and CO_2 .
- iv) $\beta_1 < 0$, $\beta_1^2 > 0$ and $\beta_2 = \beta_3 = \beta_4 = 0$. An inverted U-shaped relationship.
- v) $\beta_1 > 0$, $\beta_1^2 < 0$, and $\beta_2 = \beta_3 = \beta_4 = 0$. An inverted U-shaped relationship.

5. Econometric Methodology

5.1 Unit Root Test

From the non-stationary variable properties analysis, it is observed that the application of Ordinary Least Square (OLS) techniques with these variables can demonstrate spurious regressions. So it is essential to justify stationary before estimating the variables.

In order to detect the stationarity of the series, the Unit Root test can be used. The Augmented Dickey-Fuller (ADF) test will be used to examine whether each variable contains a unit root problem or not. The form of the ADF test with trend and intercept is given below:

$$\Delta y_t = \alpha + \delta_t + \beta y_{t-1} + \sum_{i=1}^k \gamma \Delta y_{t-1} + u_t \quad (4)$$

Where Δy_t denotes the first difference of y , u_t demonstrates the errors of serial correlation and α , δ , β , and γ are parameters of the model to be estimated. The null and alternative hypothesis for a unit root in variables y_t are:

$$H_0 = \beta = 1$$

$$H_1 = \beta < 0$$

If the null hypothesis is not rejected, then we have the problem of unit root in the series.

The unit root outcomes are presented in Table 1. Considering the outcomes of ADF it is found that all variables were integrated of order 1, i.e., I (1) which directs that all the variables were stationary at their first difference except CO₂ and TO, found stationary at integrated of order zero, i.e., I (0), at 1% and 5% level of significance respectively. So it can be said that there exists a mixed strategy. In the absence of any I (2) series sets and relying on this ADF result, the condition for the autoregressive distributed lag co-integration bound testing (ARDL) approach is met.

5.2 Lag Length Criteria:

In this paper, the ARDL model is applied to establish the short run (SR) and LR association amid the variables. Moreover, the identification of optimal lag number is needed to establish for demonstrate the appropriate relationship amid the variables. To determine the optimal number of lags in this paper, sequential modified LR test statistics, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQ) are used.

From the outcomes of Vector Auto Regression (VAR) it is observed that the optimum lag order will be 2 based on the minimum value of Akaike Information Criteria depicted in Table 1.

5.3 Johansen Co-Integration Test

In this paper, the cointegration test will be applied to examine whether there exists any LR association or not. For that, the Johansen and Juselius (1990) test has been used to examine the presence of LR association amid the said variables.

In this study, unrestricted cointegration rank test (Trace) to detect whether CO₂ is co-integrated with real GDP per capita, squared of real GDP per capita, energy consumption, international trades and urbanization.

To determine the order of r the likelihood ratio (LR) trace test statistic has been applied which is proposed by Johansen (1988)

$$\lambda_{trace}(q, n) = -T \sum_{i=q+1}^k \ln(1 - \hat{\lambda}_i) \quad (5)$$

From the equation 5 demonstrates, $r = 0, 1, 2, \dots, k-1$, T is the number of observation used for estimation λ_i is the i^{th} largest estimated eigenvalue. The maximum eigenvalue (LR) test statistics as proposed by Johansen is :

$$\lambda_{max}(q, q+1) = -T \ln\{1 - \lambda_{-(q+1)}\} \quad (6)$$

The outlined statistics either does not rejects the null hypothesis that there is one co-integrating relation amid the variables ($r \leq 1$) or rejects the null hypothesis of co-integration amid the variables ($r=0$).

From Table 3, it is found 2 co-integrating equations at the significance level of 5% from the Trace test indicates.

5.4 Bound Testing Approach for Co-integration

Granger (1981), Engle and Granger (1987), Pesaran and Shin (1999) have established the ARDL approach to finding out the LR relationship among the time series on the subject of non-stationary and stationary data series. This method is a combination of LR and SR coefficients. Better results can be achieved from the ARDL approach to cointegration in the case of small sample data sets (Haug, 2002). Hence, this study will be applied to the ARDL test instead of using traditional approaches due to a small sample data set.

This study has used the unrestricted error correction model (UECM) because it considers the proper lags that capture the data generating procedure within the general-to-specific framework (Laurenceson & Chai, 2003). Proper adjustment of the orders of the ARDL model, the following UECM is used for this study purpose.

$$\begin{aligned} \Delta \ln CO_{2t} = & \alpha_0 + \sum_{i=1}^p \varphi_{1i} \Delta \ln CO_{2t-i} + \sum_{i=1}^p \chi_{2i} \Delta \ln Y_{t-i} + \sum_{i=1}^p \sigma_{3i} \Delta \ln Y_{t-i}^2 + \sum_{i=1}^p \gamma_{4i} \Delta \ln En_{t-i} \\ & + \sum_{i=1}^p \theta_{5i} \Delta \ln TO_{t-i} + \sum_{i=1}^p \omega_{6i} \Delta \ln U_{t-i} + \lambda_1 \ln CO_{2t} + \lambda_2 \ln Y_t + \lambda_3 \ln Y_t^2 \\ & + \lambda_4 \ln En_t + \lambda_5 \ln TO_t + \lambda_6 U_t + \xi_t \end{aligned} \quad (7)$$

where, $(\varphi, \chi, \sigma, \gamma, \theta, \text{ and } \omega)$ represents the SR, and $(\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5, \lambda_6)$ represent the LR parameters. The null hypothesis (presenting no-co-integration between variable) is

$$H_0 : \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = 0$$

Whereas, the alternative hypothesis (showing co-integration between variables) is

$$H_1 : \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq 0$$

There will be no cointegration amid variables if the value of the F-statistic is lower than Lower Critical Bound (LCB); if Upper Critical Bound (UCB) is lower than the F-statistic then the decision will be a co-integration among the stated series and if the value of F-statistic found between UCB and LCB then the decision will be inconclusive. In these circumstances, this study solely depends on the lagged error correction term (ECM_{t-1}) for an LR relationship.

By applying OLS on equation (7) the F-statistics value can be obtained. The results indicates that the value of the F-statistics go beyond the Upper and Lower Bound (Table 4), on the basis of the reference suggested by (Narayan, 2005), the result endorses that there is co-integration amid the variables at the significance level of 5%. Thus, it can be stated that CO_2 is cointegrated with energy consumption, real GDP per capita, squared GDP per capita. International trade openness and urbanization when CO_2 emissions are the dependent variables.

As there exists an LR association amid the said variables, the SR relationship of variables shall be examined by the following vector ECM model

$$\begin{aligned} \Delta \ln CO_{2t} = & \alpha_0 + \sum_{i=1}^p \varphi_{1i} \Delta \ln CO_{2t-i} + \sum_{i=1}^p \chi_{2i} \Delta \ln Y_{t-i} + \sum_{i=1}^p \sigma_{3i} \Delta \ln Y_{t-i}^2 + \sum_{i=1}^p \gamma_{4i} \Delta \ln En_{t-i} \\ & + \sum_{i=1}^p \theta_{5i} \Delta \ln TO_{t-i} + \sum_{i=1}^p \omega_{6i} \Delta \ln U_{t-i} + \lambda ECM_{t-1} + \xi_t \end{aligned} \quad (8)$$

ECM_{t-1} is the one period lagged error term derived from the LR equation. It is expected that ECM_{t-1} coefficient will be negative and significant. The speed of adjustment will be volatile if it is found positive. Thus, ECM_t has been defined in the following equation:

$$ECM_t = \ln CO_2 - \hat{\alpha}_0 - \sum_{i=1}^p \hat{\lambda}_{1i} \ln Y_{t-i} - \sum_{i=1}^p \hat{\lambda}_{2i} \ln Y_{t-i}^2 - \sum_{i=1}^p \hat{\lambda}_{3i} \ln En_{t-i} - \sum_{i=1}^p \hat{\lambda}_{4i} \ln TO_{t-i} - \sum_{i=1}^p \hat{\lambda}_{5i} \ln U_{t-i} \quad (9)$$

The LR elasticity of CO₂ in regard to EG, energy consumption, trade and urbanization is presented in Table 5. It demonstrates that a 1 percent increase in energy consumption raises CO₂ consumption by 2.65 percent in LR. Both real GDP per capita and squared real GDP per capita show the existence of an inverted U-shaped correlation between EG and CO₂ emissions. The coefficients acquired for GDP per capita linear and non-linear terms are 12.02 and -0.979 respectively, which determines the existence of an EKC between per capita CO₂ emissions and EG in the case of Bangladesh. The squared term's negative sign supports the delinking of carbon emissions and real GDP per capita in the nation. This indication bears out that CO₂ emissions increase in the first stage of economic growth and decline at a certain level. These outcomes are coherent with numerous studies examining the link between GDP growth and CO₂ emissions (Song et al., 2008).

Halicioglu (2009), Jalil and Mahmud (2009) and Fodha and Zaghdoud (2010) found that the coefficient on international trade showed a negative impact on CO₂ emissions. The coefficient of TO on CO₂ is negative, and statistically significant. It demonstrates that for 1 percent raise in international trade results in a 0.110928 decrease in CO₂ emissions.

Table 5 also represents the SR relationship. Though the SR coefficients are smaller than LR, the coefficient of real GDP per capita and squared of real GDP per capita bear out the EKC relation. The impact of trade is very small, say -0.033 which is insignificant. There exists an affirmative correlation between CO₂ emission and real GDP per capita. For 1 percent growth of real GDP per capita, on average, leads to carbon emission increase of 6.15 percent. The highly significant R-squared value denotes the goodness of fit.

Energy consumption shows a positive relationship such as for a 1 percent upsurge in energy consumption, on average, the CO₂ emission rises by 6.15 units, while other things remain constant.

The effect of urbanization was significantly positive which indicates that the higher the urban population, the higher demand for energy consumption and hence the upsurge of emissions (CO₂). This study also found that a 1 percent increase in the urban population will lead to an increase of 0.0207 percent in CO₂ emissions. All of the probabilities show less than 5 percent values that represent significant results.

The lagged ECM term has a negative and significant value at the 1 percent level meaning that there exists an LR relation among the running variables. Moreover, the ECM value suggests that a change in CO₂ emissions (SR to LR) equilibrium is adjusted by approximately 3 percent each year.

5.6 Sensitivity analysis and Sensitivity Analysis

The final stage of the ARDL approaches is the stability test that is used to check the stability of LR and SR parameters. From the Lagrange multiplier (LM) serial correlation test, normality and Autoregressive Conditional Heteroscedasticity (ARCH) diagnostic test result (Table 6), it is noticeably demonstrating that autocorrelation and multicollinearity have not been found and also it is normally distributed For the cumulative sum (CUSUM) and Cumulative sum of squares (CUSUMsq) tests (Figure 4 and Figure 5), the state lines in the figure demonstrate the 5 percent critical bounds which have been used to check for parameter stability. The graph lies within appropriate bounds, 5% in this case, supporting the stability of the parameter.

6. VECM Granger Causality Analysis

The cointegration association does not specify the way of causal correlation amid variables but it only indicates the existence of a causal association between variables while the test of Engle and Granger has been used for determining the exact causal association between variables. The Granger causality's augmented form includes the error correction term and has been framed in a multivariate p^{th} order vector error correction framework, in order to the existence of the cointegrated association. This study shall have to depend on the lagged error correction term (ECM_{t-1}) for an LR association. An error correction outcome can be derived as:

$$\begin{bmatrix} \Delta \ln CO_{2t} \\ \Delta \ln Y_t \\ \Delta \ln Y_t^2 \\ \Delta \ln En_t \\ \Delta \ln TO_t \\ \Delta \ln U_t \end{bmatrix} = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \\ C_6 \end{bmatrix} + \sum_{j=1}^k M \begin{bmatrix} \Delta \ln CO_{2t-j} \\ \Delta \ln Y_{t-j} \\ \Delta \ln Y_{t-j}^2 \\ \Delta \ln En_{t-j} \\ \Delta \ln TO_{t-j} \\ \Delta \ln U_{t-j} \end{bmatrix} + \begin{bmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_3 \\ \lambda_4 \\ \lambda_5 \\ \lambda_6 \end{bmatrix} ECM_{it-1} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \end{bmatrix} \quad (10)$$

Where, $M =$

$$\begin{bmatrix} \psi_{11j} & \psi_{12j} & \psi_{13j} & \psi_{14j} & \psi_{15j} & \psi_{16j} \\ \psi_{21j} & \psi_{22j} & \psi_{23j} & \psi_{24j} & \psi_{25j} & \psi_{26j} \\ \psi_{31j} & \psi_{32j} & \psi_{33j} & \psi_{34j} & \psi_{35j} & \psi_{36j} \\ \psi_{41j} & \psi_{42j} & \psi_{43j} & \psi_{44j} & \psi_{45j} & \psi_{46j} \\ \psi_{51j} & \psi_{52j} & \psi_{53j} & \psi_{54j} & \psi_{55j} & \psi_{56j} \\ \psi_{61j} & \psi_{62j} & \psi_{63j} & \psi_{64j} & \psi_{65j} & \psi_{66j} \end{bmatrix} \quad (11)$$

Where, ECM_{t-1} is the lagged error-correction term, derived from the LR co-integrating equation, and $\varepsilon_{1t}, \varepsilon_{2t}, \varepsilon_{3t}, \varepsilon_{4t}, \varepsilon_{5t},$ and ε_{6t} are serially independent random error terms with mean zero and finite covariance matrix.

From Table 7 it can be said that there exists SR bidirectional causality is seen amid trade openness and EG ($\Delta \ln TO \Leftrightarrow \Delta \ln Y$ and $\Delta \ln Y^2$), urbanization and EG ($\Delta \ln U \Leftrightarrow \Delta \ln Y$ and $\Delta \ln Y^2$). The study also find unidirectional causality from EG to CO₂ emissions ($\Delta \ln Y$

and $\Delta \ln Y^2 \Rightarrow \Delta \ln$) trade openness to energy consumption ($\Delta \ln TO \Rightarrow \Delta \ln En$), urbanization to energy consumption ($\Delta \ln U \Rightarrow \Delta \ln En$), urbanization to trade openness ($\Delta \ln U \Rightarrow \Delta \ln TO$), CO₂ emissions to trade openness ($\Delta \ln CO_2 \Rightarrow \Delta \ln En$) and CO₂ emissions to urbanization ($\Delta \ln CO_2 \Rightarrow \Delta \ln U$).

The significant of ECM_{t-1} for CO₂ emissions in VECM equations demonstrate the speed of adjustment toward the LR equilibrium is 10.84 percent which is at the significance level of 1%. The coefficients of ECM_{t-1} for EG, trade openness and urbanization VECM equations have a positive signs, but are not statistically significant.

7. Conclusion and Policy Implications

The study investigates the association amid carbon emission, EG, energy consumption, trade openness, and urbanization in Bangladesh over the period of 1972-2014. By applying the ARDL model the EKC hypothesis has been examined. From the analysis, it is found that there exists an LR association amid the said variables giving an indication of the existence of EKC in Bangladesh discloses the attempt of a nation to shorten CO₂ emissions. To reduce the adverse effect of CO₂ emissions appropriate laws should be undertaken and environmental taxes such as green taxes and / or carbon tariffs also should be employed in both the urban and rural ranges. The outcome of causality demonstrates that EG causes CO₂ emission. Urbanization and trade openness Granger cause the EG one another. Whereas, SR unidirectional causality was observed from EG towards energy consumption.

This study finding suggests that the Government of Bangladesh should emphasis using renewable energy resources largely for achieving sustainable development goals and also to keep the environment free from depletion. To reduce the adverse effect of CO₂ emissions and other GHGs emissions on the environment priority should be given to implementing climate-friendly policies and efficient technologies for domestic manufacturing. Due to the scarcity of decent jobs in rural areas the movement of these people to the urban areas cannot be stoppable and manageable which adversely affects the ecological balance. So the government of Bangladesh should take the proper measures for creating job placement in rural or suburban areas, huge investments in human capital formation, give skilled-based training and provide finance to the small entrepreneurial skills both in the SR and LR.

The high EG certainly increases the environmental degradation, on the other hand, it has an inverse effect that is the reduction in EG can also increase the level of unemployment further in a developing country like Bangladesh. So the Government of Bangladesh must implement the most relevant rules and regulations for tackling environmental degradation competently as well as provide employment ability for making sustainable growth. This study suggests that the government may take into account a comprehensive set of climate solutions. A few of these policies may be - enlarging the use of renewable energy rather than non-renewable, people should use close substitutes instead of high dependency on

coal and other fossil fuels, and government should invest in efficient energy technologies so that the energy system should be transformed into cleaner energy and building clean-energy- economy movement.

This study has considered only CO₂ emission as a proxy variable of environmental degradation. Due to the limitations of data, it does not take into account other Greenhouse Gases (GHG's) such as carbon monoxide (CO), sodium dioxide (Na₂O), nitrogen oxide (N₂O), and methane (CH₄) that are relevant measures of environmental degradation. The data for all the variables are retrieved from the World Development Indicators (WDI) database up to 2014 due to the non-availability of data for some variables beyond this period. Further researchers should use regionally disaggregated emissions data to accomplish a wide-ranging impact which will provide new insights to the policymakers in controlling the degradation of the environment at the regional and district levels. To investigate the EKC hypothesis in Bangladesh other forms of GHGs should be used.

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Appendix

Table 1. Summary of Unit Root Test Results

ADF Test at Level with trend and intercept			ADF Test at 1st Difference with trend and intercept		
Variable	T-Statistics	P-Value	Variable	T-Statistics	P-Value
$\ln CO_{2t}$	-5.24629***	0.0006	$\Delta \ln CO_{2t}$	-6.01462***	0.0001
$\ln Y_t$	-0.58868	0.9992	$\Delta \ln Y_t$	-9.51460***	0.0000
$\ln Y_t^2$	0.99179	0.9998	$\Delta \ln Y_t^2$	-9.02760***	0.0000
$\ln En_t$	-0.93946	0.9415	$\Delta \ln En_t$	-9.11936***	0.0000
$\ln TO_t$	-3.60050**	0.0418	$\Delta \ln TO_t$	-8.10338***	0.0000
$\ln U_t$	-2.59765	0.2833	$\Delta \ln U_t$	-3.77679**	0.0281

Note: ***P < 0.01 denotes significant at 1% level, **P < 0.05 denotes significant at 5% level, *P < 0.10 denotes significant at 10% level

Table 2. Lag Length Selection Criteria

VAR Lag Order Selection Criteria						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	221.4139	NA	1.37e-11	-10.82070	-10.60959	-10.74437
1	481.3378	441.8707	1.10e-16	-22.56689	-21.30023*	-22.10891
2	522.6077	59.84123*	5.19e-17*	-23.38038*	-21.05817	-22.54075*
3	545.6939	27.70353	6.73e-17	-23.28470	-19.90694	-22.06341

* Indicates lag order selected by the criterion.

LR: Sequential modified LR test statistic (each test at 5% level)

FPE: Final Prediction Error

AIC: Akaike Information Criterion

SC: Schwarz Information Criterion

HQ: Hannan-Quinn Information Criterion

Table 3. Summary of Johansen and Juselius (1990) Co-integration test

Hypothesized No. of CE(s)	Eigen value	Trace statistic	5% Critical Value	P-value
None*	0.633904*	93.30587	69.81889	0.0002
At most 1	0.478861	53.11152	47.85613	0.1148
At most 2	0.334315	27.04199	29.79707	0.1006
At most 3	0.144951	10.76443	15.49471	0.2264
At most 4*	0.106416*	4.500595	3.841466	0.0339

Trace test indicates 2 co-integrating equation(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

** MacKinno-Haug-Michelis (1999) p-values

Table 4. Summary of Bound Testing Co-Integration Test

Bounds Testing to Co-integration		Diagnostic tests			
Estimated Models	F-statistics	X ² Normal	X ² ARCH	X ² RESET	X ² SERIAL
$F_C(CO_2/Y, Y^2, En, TO, U)$	11.634	0.610	0.6438	0.99	0.0159
$F_Y(Y/CO_2, Y^2, En, TO, U)$	151.14	0.89	0.4518	0.000	0.4223
$F_{Y^2}(Y^2/CO_2, Y, En, TO, U)$	160.00	0.89	0.4424	0.000	0.4056
$F_E(En/CO_2, Y, Y^2, TO, U)$	16.754	0.87	0.025	0.4223	0.0054
$F_{TO}(TO/CO_2, Y, Y^2, En, , U)$	4.8684	0.759	0.1294	0.0724	0.5659
$F_U(U/CO_2, Y, Y^2, En, TO,)$	9.517	0.115	0.0229	0.0029	0.0095
Significant Level	Critical Value (41)				
	Lower Bound I(0)	Upper Bound I(1)			
1% Level of Significance	3.41	4.68			
5% Level of Significance	2.62	3.79			
10% Level of Significance	2.26	3.35			

-The optimal lag is determined by AIC. Critical values for the bounds are computed using the surface response procedure.

Table 5. Short Run and Long Run Equation Estimation Results

Variables	Long Run	Short Run
Constants	-52.20679*** (0.0000)	-25.02071*** (0.0000)
$\ln Y_t$	12.01795*** (0.0000)	
$\ln Y_t^2$	-0.979858*** (0.0000)	
$\ln En_t$	2.647614*** (0.0000)	
$\ln TO_t$	-0.110928** (0.0195)	
$\ln U_t$	0.012210*** (0.0000)	
$\Delta \ln Y_t$		5.127577*** (0.0000)
$\Delta \ln Y_t^2$		-0.439761*** (0.0000)
$\Delta \ln En_t$		0.615056*** (0.0000)
$\Delta \ln TO_t$		-0.033673*** (0.0000)
$\Delta \ln U_t$		0.020274*** (0.0000)
ECM(-1)		-0.0303620*** (0.0000)

Note: ***P < 0.01 denotes significant at 1% level, **P < 0.05 denotes significant at 5% level, *P < 0.10 denotes significant at 10% level. The p-values are in parenthesis

Table 6. Sensitivity Test

Sensitivity Analysis	Coefficients
Serial Correlation	1.096825 (0.3593)
Normality	0.033029 (0.9836)
ARCH	0.929306 (0.5688)

Table 7. Results of Granger Causality

	$\Delta \ln CO_2$	$\Delta \ln Y$	$\Delta \ln Y^2$	$\Delta \ln En$	$\Delta \ln TO$	$\Delta \ln U$	<i>ECM</i>
	F-statistics						t-statistics
$\Delta \ln CO_2$		5.2097** (0.0103)	4.43261** (0.0190)	2.1254 (0.1341)	0.006917 (0.9333)	0.33787 (0.7155)	10.8384*** (0.0002)
$\Delta \ln Y$	1.30887 (0.2827)		2.53157* (0.0936)	2.09552 (0.1378)	9.82332*** (0.0004)	41.4341*** (0.000)	0.03513 (0.9655)
$\Delta \ln Y^2$	1.32192 (0.2793)	2.35828 (0.1090)		2.41589 (0.1036)	9.73544*** (0.0004)	41.9441*** (0.000)	0.03669 (0.9640)
$\Delta \ln En$	0.60630 (0.5508)	0.63387 (0.5364)	0.63371 (0.5364)		6.37799** (0.0043)	43.7796*** (0.000)	0.58548 (0.5622)
$\Delta \ln TO$	4.61001** (0.0165)	4.77657** (0.0145)	4.72196** (0.0151)	0.00945 (0.9906)		16.2079*** (1.E-05)	1.54937 (0.2266)
$\Delta \ln U$	38.7865* (0.000)	3.28176** (0.0491)	3.23272*** (0.0511)	2.10163 (0.1370)	1.34813 (0.2725)		1.15774 (0.3259)

Note: Value under parenthesis represents P-value. ***P < 0.01 denotes significant at 1% level. **P < 0.05 denotes significant at 5% level, *P < 0.10 denotes significant at 10% level.

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ENERGY CONSUMPTION

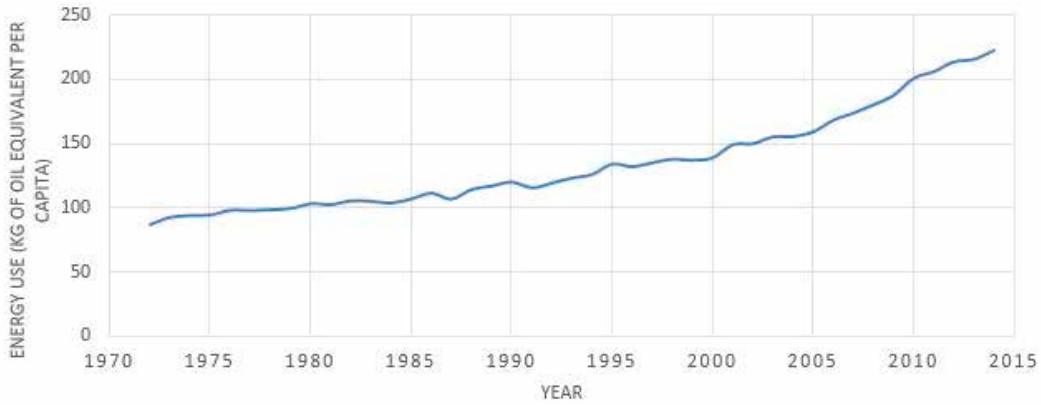


Figure 1. Energy Consumption

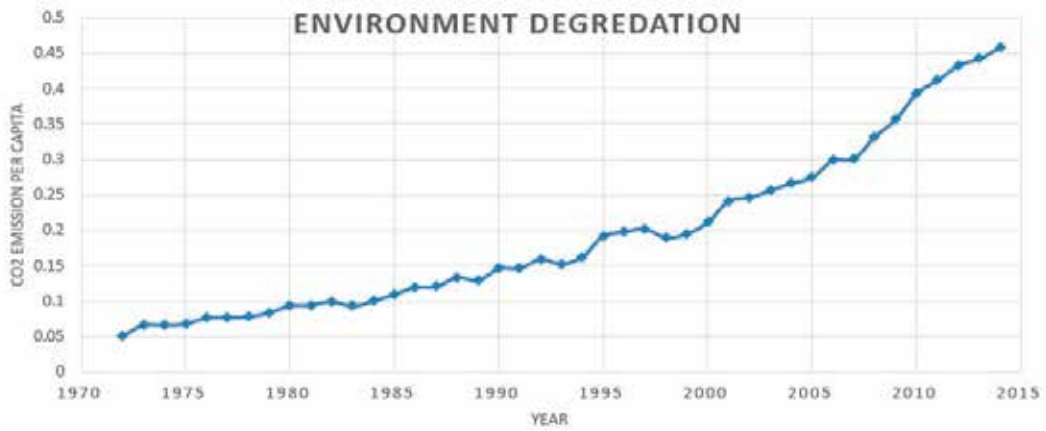


Figure 2. CO2 Emission Per Capita

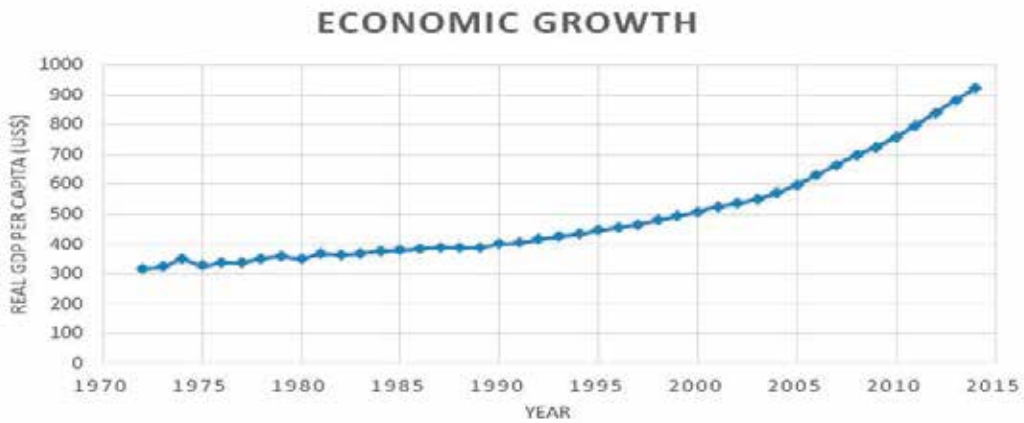


Figure 3. Economic Growth

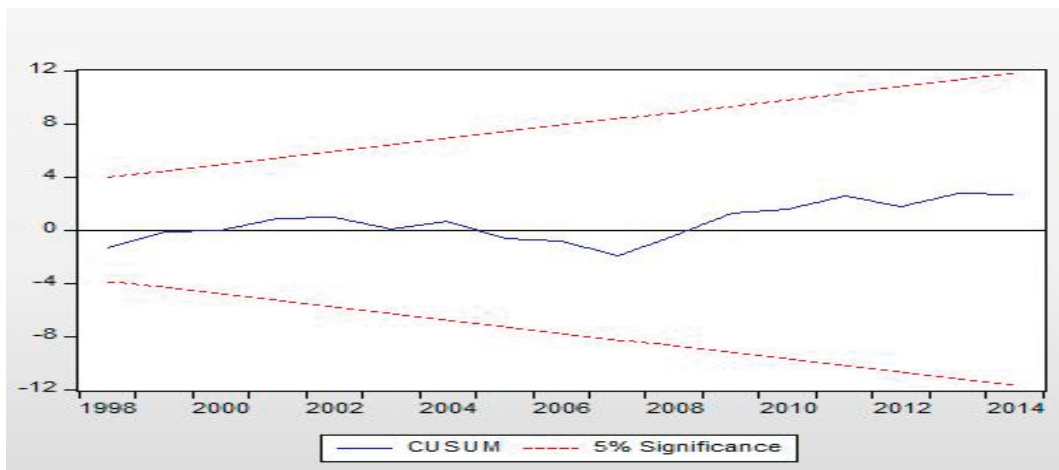


Figure 4. Plot of Cumulative Sum of Recursive Residuals

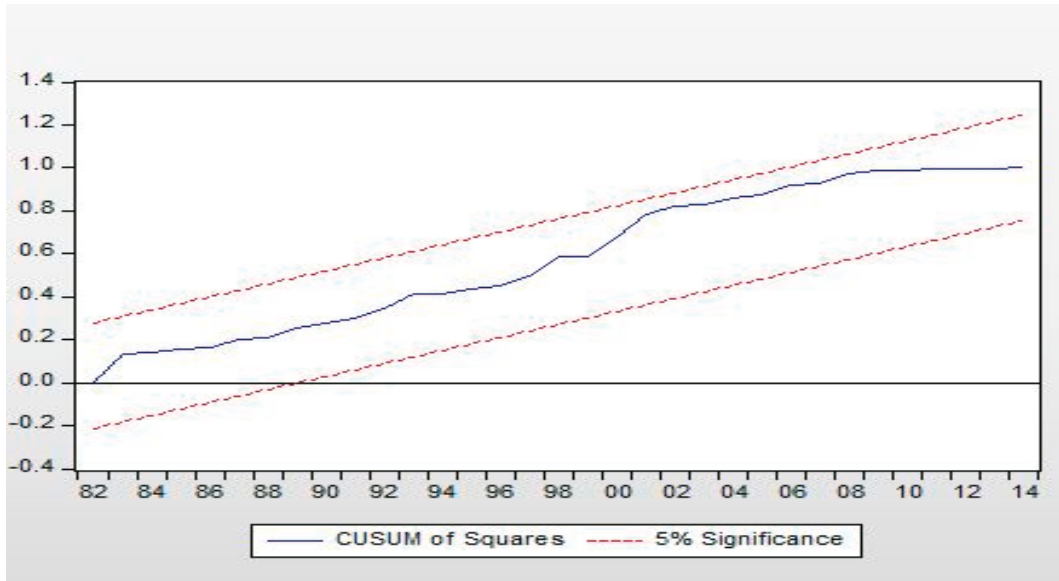


Figure 5. Plot of Cumulative Sum of Squares of Recursive Residuals

Liberation War of 1971 and Present Bangladesh: A Study on the State of Nation and Generation

Submission: 23-09-2021
Acceptance: 05-07-2022

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Abstract: *As the cost of Bangladesh's independence has been colossal so it is expected that the post-1971 generation would well aware about the history of liberation war. The present study enquired into the eagerness and awareness of present generation about the history of the country. This was a descriptive study. It utilized the data and information from both secondary sources i.e. previous studies and primary sources, i.e. survey with a set of questions. The study revealed the fact that the views of post-independent generations about the liberation war of 1971 have been the consequences of killing of elected leader and capturing of governmental power in August 15, 1975. Thereafter, the 'spirit of 1947 partition' had been re-surfaced in post-1975 Bangladesh. We found that some considerable number of the respondents have insufficient knowledge on and quite ignorant about the important facts and figures of liberation war. For this we suggest for governmental steps to create consciousness in this regard. Besides, There is a great need of research on this area.*

Keywords: Liberation War, Present-Bangladesh, Present-generation, State of nation

1. Introduction

Bangladesh's Liberation War in 1971 was fought for independence of the country from religious colonial subjugation of Pakistan. After independence in 1971, despite the grim and pessimistic predictions of the early years, Bangladesh was able to achieve "an inflection point" within a short time; and the country has since emerged as one of the most amazing and unexpected success stories in Asia in recent times. Within a span of fifty years, the transformation of the country from a 'basket case' in the 1970s to the present is a rare example of a neo-liberal development model, one of the most spectacular development achievements of the 21st century, where social progress has far surpassed economic growth (Mujeri, 2021). This would not have been possible without independence. Thus, while presenting the development story of 21st century Bangladesh, the question arises how much the present generation of Bangladesh interested and aware about the history of independent Bangladesh, acquired through the war of liberation under the leadership of Bangabandhu Sheikh Mujibur Rahman.

However, due to discrimination against them in politics, economy, civil and military administration, the (East) Bengalis had protested vigorously and Bangabandhu (Friend of Bengal) Sheikh Mujibur Rahman declared independence on March 26, 1971. To suppress the unrest in East Pakistan, the Pakistani government sent troops to East Pakistan and unleashed a massacre. Thus, the war for independence commenced. The nine-month long war witnessed the lives of 3 million (East) Bengalis. To change the race of the Bengalis, rape was carried out in a systematic manner against 200,000 to 4,00,000 Bengali women by the Pakistani occupation forces. The broad abominations, corrupting, and brutal treatment and assault committed by the Pakistani forces can be identified as crimes

against humanity. Besides, several thousand Indian soldiers had sacrificed their lives for the independence of Bangladesh. Finally, the Pakistani occupation forces surrendered on December 16, 1971. As the cost of Bangladesh's independence has been immense so it is expected that the post-1971 (liberation war) generation would well aware about the history of liberation war. However, the things did not move in expected way. Bangladesh's father of the nation Bangabandhu Sheikh Mujibur Rahman had been assassinated in August 15, 1975 and everything started to move in Pakistani style. According to a noted historian of the country the crisis of independent Bangladesh has been the consequences of 'unbound ignorance about country's history and tradition and extreme callousness, ambiguity in thought and spirit, and lack of practical attitude (Ahmed, 2016).' He said, in many a times it has been observed that to realize narrow political or group or personal interests we deny the real event or want to forget the known things. Such apathy to express the truth is tantamount to moral timidity. The whole nation has to pay for it. Following this observation, the question emerges, how the post-1971 generations consider the liberation war of 1971 in 21st century? The present study attempts to address the question by enquiring into the awareness and eagerness of post-1971 generations about liberation war of Bangladesh. Awareness means the quality or state of being aware and understanding that something happened, happening, exists or existed (Merriam-Webster, 2022).

2. Review of Previous Studies

Liberation war of 1971 has always been at the core of Bangladesh's national identity as it was a way of establishing statehood on the basis of linguistic nationalism, which was initiated immediate after the partition in 1947. 'The Unfinished Memoirs' of Bangabandhu goes on to trace the painful dynamics of the 1947 partition, the mounting disillusionment of the people of the eastern wing of Pakistan with the authorities in the west, the formation of the Awami League (in 1949) in response to the Muslim League's growing alienation, and the concerted movement against the imposition of Urdu as the state language, which eventually sowed the seeds of the liberation struggle. The birth of Bangladesh brought with it the hope for a secular, democratic, socialist country where Bengali culture would flourish (Selim, 2014). In popular representations and the nationalist history of Bangladesh the war has been depicted in terms of genocide and atrocities of Pakistani occupation forces and their local collaborators.

Four decades ago, in 1981, noted Political Scientist and National Professor Abdur Razzaq had delivered a historic lecture titled Bangladesh: State of the Nation. In this lecture, Professor Razzaq addressed the question, what makes of us a nation and precisely analyzed the history of Bangladesh. He compared the millions who had identified themselves with Bangabandhu in the liberation war of 1971, with the millions who had been swept by the idea of a Pakistani nation (p.18) in 1947. This lecture was given after five years of Bangabandhu's assassination, and at a time when the killers were entertained by the military ruler with charity of the state. During this junction of Bangladesh's history, Professor Razzaq observed, each revolutionary, whatever his revolution may be about, will inevitably be treated, at best with contemptuous indifference by the revolutionary of the next generation. And the state of the nation will reflect the ever-

present struggle between generations. It does so in Bangladesh.

Professor Razzaq's observation made us curious about the generational identity of the people whom he termed as revolutionary. This curiosity begets the question, whether Professor Razzaq had considered the post-1975 military ruler(s) as revolutionary, and posited them against the revolutionary of the liberation war of 1971?! However, struggle for survival of the spirit of liberation war against the spirit of 1947 partition or the process of Pakistanization could be found in different forms.

Another historian Muntassir Mamoon (2016) observed that the rulers from 1975-1996 and 2001-2008 have tried in various ways to erase the memories of liberation war. Four national leaders of liberation war and close associates of Bangabandhu were killed in the Dhaka Central Prison in 3rd November, 1975. Many people had protested these heinous acts. On the other hand, without any protest against these barbarous acts, many 'freedom fighters of 1971' have served the military rulers happily, even though, the first military ruler had executed 496 military officers, who altogether were freedom fighters. These freedom fighters were executed in a secret military trial and they were not given any chance to defend themselves.

Nevertheless, the curiousness that has been ignited by Professor Razzaq's observation, led us to address the initial question of the present study. At this point, we confront a two-way dilemma, 'disinterest' (Mohiuddin 2011) of the generations about the liberation war of Bangladesh, and in terms of Enayetur Rahim (2002) 'lacks of historical canon.' In many parts of the world historical interpretations used methods of historical analyses that were derived from a range of theories that attempted to explain and interpret the past (Thapar, 2014). As a nation-state Bangladesh also needs to turn up to that stage because of its emergence through blood and tears throughout the history of liberation war.

In his book 'A History of Bangladesh', van Schendel (2009) gives us the gradual movements towards independent Bangladesh such as six-point movement of 1966, mass-upsurge of 1969, 1970's election and then Liberation War of 1971. Schendel has also focused on the socio-cultural reasons behind the war. In his another study, Willem van Schendel (2017) initially has mentioned about three narratives on the Liberation War of 1971: the war as a national triumph, the war as betrayal and shame, and the war as a glorious campaign. According to Schendel, these are all first-generation narratives. In a later period, more layered interpretations have superseded these interpretations. However, comparing Bangladesh's liberation war with other struggle for survival, Schendel has mentioned second-generation narratives that challenge the historiographical apportioning of blame and the national/ethnic framing of the conflict. Accordingly, and finally, Schendel presents the idea of 'war within a war' regarding the narratives of Bangladesh's liberation war.

¹ See the report titled Col Taher was not the only victim, *496 military men executed in secret trial during Zia's period, Inu tells HC*. The Daily Star 12:00 AM, January 12, 2011 / LAST MODIFIED: 12:00 AM, January 12, 2011 Retrieved from <https://www.thedailystar.net/news-detail-169707> on August 11, 2018.

A Bangladeshi Professor of Ball State University of the USA Dr. Rahamatullah Emon confronted with question, why there was not much research works on the huge occurrence like Liberation War 1971? Even though, the potentials of such research on different aspects of liberation war are immense. However, sadly and truly, research on this area is very much insufficient. Rahmatullah Emon (2016) termed it as "utterly reprehensible". On the other hand, former National Professor Anisuzzaman (1984) observed, '...within one era, the country has lost all main characters of Bangladesh's liberation war. Besides, the principles and ideology of liberation war have been abandoned. May be this is also a cause for not so much writing on liberation war.'

The 21st century Bangladesh has been designated as the 'role model of development'. It was beyond any imagination during the era of oppression and exploitation in the name of religion by Pakistan from 1947 to 1971. However, we can find some selected indicators of Bangladesh's development picture in 1971 and compare it with that of recent times.

Table 1. Comparative picture of Bangladesh's Social Development Indicators in 1970-71 and 2021

Indicator	Bangladesh		
	1970/71	2021	Source
GDP per capita	133 US \$	2,227 US \$ (Tk 188,873)	Bangladesh GDP per capita, 2022
Life expectancy (years) at birth	47	72.87 years	World Life expectancy at birth (2022)
Infant mortality rate	149	23.672 deaths per 1000 live births	Bangladesh Infant Mortality Rate (2015-2022)
Total fertility rate	6.9	1.979	World Total Fertility Rate, Knoema (2022)
Mean years of schooling of adults	2.4	6.55(2019)	Human Development Report 2020
DPT child immunization rates (%)	2	98	Human Development Report 2020
Access to improved sanitation (%)	35	65	World Health Organization (2020)
Prevalence of undernourishment (%)	34	9.7	Prevalence of undernourishment (2019)

Source: Compiled by the author

² TFR : According to the Population Reference Bureau, Total Fertility Rate (TFR) is defined as, "the average number of children a women would have assuming that current age-specific birth rates remain constant throughout her childbearing years." Simply put, total fertility rate is the average number of children a woman would have if she survives all her childbearing (or reproductive) years. Childbearing years are considered age 15 to 49.

From the above Table we found Bangladesh's present development status compared to 1970s. However, while the country was celebrating its 50th anniversary, it has been considered a role model of development. Over the years, Bangladesh has made wonderful advancement on the fronts of economic and human development. It has achieved an annual average GDP growth rate of nearly six percent since 1991, resulting in an economy of USD 330 billion in 2019 from a USD 35 billion economy in the mid-1990s. Over the same time, per capita income has increased from USD 300 to about 2,227 US \$ (Tk.1, 88,873)-more than seven fold raise. The incidence of poverty, as measured by the headcount ratio based on a national poverty line, has declined from 58 percent in 1990 to nearly 21 percent in 2019. More than 24 million people were thus lifted out of poverty. Today, Bangladesh is in the medium human development category, and in 2015, it moved to the "lower-middle-income" country category from the "low-income" category. It is moving towards official LDC graduation in 2024 and looks forward to achieving "developed country" status by 2041. From 1990 to 2019, Bangladesh's Human Development Index (HDI) value improved from 0.394 to 0.632-a nearly three-fifth increase. Thus, even with a lower GDP per capita (in 2017), compared to countries like India and Pakistan, Bangladesh achieved a life expectancy at birth of nearly 73 years, compared to nearly 70 years in India and 67 years in Pakistan. In 2019, the under-five mortality rate in per 1,000 live births was 31 in Bangladesh, 34 in India and 67 in Pakistan respectively. The overall Gross Domestic Income score for Bangladesh in 2019 was 0.904, higher than those of India (0.820) and Pakistan (0.745). Having achieved most of the targets of the Millennium Development Goals for the year 2015, Bangladesh is now working hard to achieve the Sustainable Development Goals set by the world community. (Jahan, 2021)

In view of the above picture of Bangladesh's development, the relevant question comes up; do the post-liberation (present) generation consider 'Bangladesh's present development' status as the reflection of spirit of liberation war followed by the present government? On the way to address this question and other questions that have been raised earlier, however, it is to be noted that until now, except some scattered expressions of arguments and counter arguments, no serious research work has been undertaken on the issue. For example, while dealing with the history of Bangladesh Abul Maal Abdul Muhith (2016) stopped at August 1975. He did not want to deal with more contemporary things. 'I did not want to venture into more contemporary history mainly because of my inability to spare sufficient time for the undertaking' (Muhith, 2016, p.xv). Nevertheless, the situation that emerged after the tragic changeover caused by the assassination of Father of the Nation Bangabandhu Sheikh Mujibur Rahman, have enhanced the gravity of the above questions along with the arguments surrounding the contesting ideologies and spirits, 'the spirit 1971 liberation war' and 'the spirit of 1947 partition'. Nevertheless, the 'spirit of 1947 partition' has been revived after the killings of Bangabandhu in 1975. It may be mentioned that the 'spirit of 1947 partition' could be viewed as the antonym of the 'spirit of liberation war'. While the 'spirit of 1947 partition' begets 'two-nation theory', communalism and other vices harmful to the people of Bangladesh, however, 'spirit of liberation war' has given rise to secularism, non-communalism and Bengali nationalism. It also ushered the way for socialism, democracy, secularism and Bengali

nationalism to be incorporated in the constitution as basic principles. The post-1975 Bangladesh witnessed a situation of fading away of the spirit and memory of the liberation war and its leader Bangabandhu Sheikh Mujibur Rahman. Indemnity ordinance was declared to save the killers of Bangabandhu Sheikh Mujibur Rahman from any legal trial. The military governments of post-1975 Bangladesh had appointed the killers of Bangabandhu in different diplomatic missions of the country. Not only was that, the war criminals and collaborators of Pakistani Army also appointed in the important ministries during this time.

However, after continuous movement under the leadership of Bangabandhu's daughter Sheikh Hasina and against the military dictators, some visible and remarkable change has occurred in this regard. As a consequence, when the Awami League government, under the leadership of Sheikh Hasina came to power in 1996, the situation began to change. Later on, the indemnity ordinance was annulled and the trial of Bangabandhu's killers had been completed. International Crimes Tribunal (ICT) was formed for the trial of war crimes and criminals against humanity. On the basis of the verdict of the court, some criminals have been punished. Nevertheless, due to verdict from the highest court of justice the basic principles of the constitution have been restored, but some other ideological element, which was imposed by the military rulers, remain intact. In this situation, non-attachment of the post-1971 generations with the events of liberation war of 1971 has been observed by many. For example, noted artist Aly Zaker (2017) observed 'the re-emergence of the defeated ideology and ideologues of the war that led to the birth of Bangladesh.' However, the opposite picture is also found. A strong sense of nationalism and an unquestionable glory that surrounded the spirit of liberation war have been internalised by a vast number of people who belong to the post-1971 generations. Nevertheless, following the ideology of liberation war, Bangladesh has been able to become a role model of socio-economic development under the government of Awami League led by Prime Minister Sheikh Hasina. At the same time, evidences could be also found regarding 'fading away of emotional attachment with liberation war.' From the brief review of literature, we can conclude without uncertainty that there is a research gap and thus a strong necessity to probe into the state of nation and attitude of post-1975 generations towards liberation war of 1971 in 21st century.

3. Objectives of the Study

The specific objectives of the study are,

- (1) To enquire into the important events that led to the liberation war of 1971.
- (2) To investigate into the eagerness and awareness of post-1971 generation about the liberation war 1971.
- (3) To find out the views of the post-1971 generation about the country's present development status relating to country's independence.

4. Arguments of the Study

On the basis of our problem statement and research questions we argue that,

(i) The views of post-independent generations about the liberation war of 1971 have been the consequences of killing of Father of the Nation Bangabandhu Sheikh Mujibur Rahman in August 15, 1975.

(ii) On the other hand, the 'spirit of 1947 partition' or the process of Pakistanization has been re-surfaced due to assassination of Father of the Nation Bangabandhu Sheikh Mujibur Rahman and steps of military rulers in post-1975 Bangladesh.

(iii) The recent development of Bangladesh could be viewed as the fruit of independence.

5. Definitions

(i) Generation and post-independent generation: Oxford Learners' Dictionary has mentioned several definitions of the term 'generation'. From these definitions we select two definitions for our present purpose. The term "generation" stands for "all the people who were born at about the same time." At the same time, it is also used to mean, "the average time in which children grow up, become adults, and have children of their own (usually considered to be about 30 years)."

On the other hand, by the term post-independent generation of Bangladesh, this study wants to mean the generation of people who were born after liberation war and specifically after the tragic changeover of August 15, 1975. The post-1971 generation of is specifically considered to examine and investigate the research questions of the study.

The post-1971 generation of Bangladesh has not seen the liberation war but has heard or read the history of the liberation war. They should know the exact history. A Bangladeshi keen observer said, "We notice that various changes in history take place when the government comes. History is changed according to one's own needs or convenience. This change is not a matter of happiness for a nation. Distortion of history is just a name to destroy and confuse a nation (Pandit, 2021).

(ii) Liberation War: The war which was taken place in 1971 by the people of Bangladesh, according to the call of Bangabandhu Sheikh Mujibur Rahman and in response to the war, genocide and repression by Pakistani authorities. The main purpose of the war of liberation was to establish Bengalees effective control over the territories of Bangladesh. In this war, the vital quality of the people was their 'heroism, bravery and revolutions'

6. Methodology

This is a descriptive study that utilized the data and information collected from both primary and secondary sources. Secondary data have been gathered from different existing research works on Bangladesh's liberation war of 1971. On the other hand, primary data have been collected on the basis of a set of questions and from a 'sample population' comprising population from post-1971 generation. The sample population has been selected through a 'convenience sampling'. The sample size for survey has been determined on the basis of the postulation and research question. Questions about sample size are ubiquitous in research. The need for any actual number for sample is always insufficient. No number is an all-purposive answer. Sample size should be made

by assessing the corresponding affordability (Berkowitz and Lynch, 2019). Accordingly, the sample size for the present study has been determined to 184. To collect data from the sample population a group of field workers was also employed from the students of Jagannath University. Interview was taken on the basis of a questionnaire. Collected data have been processed and tabulated manually. Later on, the tabulated and processed data have been interpreted and analyzed to meet up the objectives of the study. It may be mentioned that the study was carried out with the research grant of Jagannath University in 2019.

7. Findings of the Study

Views of Post-1971 generation on Liberation War

This section of the paper provides survey results of the study followed by discussion. It reveals the views of post-1971 generation on different dates, events, and aspects of the liberation war of Bangladesh.

Profile of the respondents

Table 2 reveals the age of the respondents. Most (38.04%) of the respondents were from the age group of 21-25 years. 22.28% respondents were from the age group of 15-20 years. Among the respondents 17.39% were from 26-30 years, 9.78% were from 31-35 years, 3.80% were from 36-40 years, 2.72% years were from 41-45 years. Rest 5.98 percent respondents were from 46 years and above age group.

Table 2. Age of the Respondents

Occupation	Number	Percentage
Student	100	54.34
Teacher	10	5.43
Farmer	5	2.72
House wife	20	10.87
Business	27	14.67
Service holder	19	10.33
Lawyer	01	0.54
Autorickshaw Driver	02	1.08
Total	184	100

Source: Field Study, 2019

Among the respondents 62.5% (115) were male and 33.98% (69) were from female. Table 3 reveals that 54.34% respondents were students, 5.43 percent were teachers, 2.72 percent were farmer, 10.87 percent of the respondents were housewife, 10.33 percent were service holder, 0.54 percent were lawyer, and 1.08 percent were autorickshaw driver.

Table 3. Occupation of the Respondents

Occupation	Number	Percentage
Student	100	54.34
Teacher	10	5.43
Farmer	5	2.72
House wife	20	10.87
Business	27	14.67
Service holder	19	10.33
Lawyer	01	0.54
Autorickshaw Driver	02	1.08
Total	184	100

Source: Field Study, 2019

Respondents were asked (Table 4) to identify the important days, from January to December, related to Bangladesh's liberation war 1971. Among the respondents 54.34% has identified correctly January 10 [Home coming Day of Bangabandhu Sheikh Mujibur Rahman], and 45.66% did not answer this question. 94.44% respondents have correctly marked February 21 as the International Mother Language Day, while only 5.56% could not answer this question. Out of total 184 respondents 60.77% correctly responded to identify March 7 as the date of historic speech of Bangabandhu. 57.69% of the respondents have correctly identified March 17 as the birth date of Bangabandhu. Due to national focus on the genocide of 1971, the post-1971 generation is becoming conscious about the fact. Accordingly, we found that 68.13% of the respondents have identified March 25 as the International Genocide Day. Overwhelming majority of the respondents (85.63%) have marked March 26 as Independence Day of Bangladesh. However, less number of the respondents (42.30%) have been able to mark April 10 as the formation of first Bangladesh government. Further, less percentage of post-generation people (37.56%) have been able to identify April 17 as the oath taking day of first Bangladesh government (Jahan, 2021).

Knowledge and information of post-independent generation about important days related to Bangladesh's liberation war

Table 4. Knowledge and Information on the Important Days related to Liberation war

Serial No.	Days	Correct	Wrong	Did not answer
01	January 10 (Home coming Day of Bangabandhu Sheikh Mujibur Rahman)	54.34%	---	45.66%
02	February 21 (International Mother Language Day)	94.44%	--	5.56%
03	March 07[Historic Speech of Bangabandhu]	60.77%	---	0.55%
04	March 17 (Birth Day of Bangabandhu Sheikh Mujibur Rahman)	57.69%	---	41.20%
05	March 25 (International Genocide Day)	68.13%	---	31.86%
06	March 26 (Independence Day of Bangladesh)	85.63%	---	14.36%
07	April 10 (Formation of First Government of Independent Bangladesh)	42.30%	---	0.54%
08	April 17 (Oath Taking of First Government of Independent Bangladesh)	37.56%	0.54%	62.50%
09	June 07 (Historic Six-Question Day)	21.73%	78.26%	
10	June 23 (Founding Date of Awami League)	29.89%	0.54%	69.57%
11	August 15 (National Mourning Day)	65.21%	0.54%	34.79%
12	December 16 (Victory Day)	81.51%	---	18.47%

Source: Field Study, 2019

Only 21.23% of the respondents have been able to mark June 07 as the historic six-Question day. On the other hand, 29.89% of the respondents have identified June 23 as the founding date of Bangladesh Awami League. However, more percentage of respondents (65.21%) have rightly identified August 15 as the National Mourning Day of Bangladesh. We found that overwhelming majority of respondents (81.51%) have marked December 16 as the Victory Day of Bangladesh. From the description of the above Table we can conclude at this point that most of the people i.e. more than 80 percent those who belong to post-1971 generations could identify three dates February 21, Independence Day 26 March and victory day 16 December. On the other hand, more than 60 percent people from post-1971 generations are aware about the dates of genocide i.e. March 25 and national mourning day i.e. August 15.

Table 5. Presentation of Correct or Wrong Responses on Important Historical Information of Bangladesh's Liberation War

Serial No.	Questions on selected important Information on Bangladesh's Liberation War	Responses			
		Correct	Partly Correct	Wrong	Did not Answer
01	When did Sheikh Mujibur Rahman adorn with Bangabandhu? (February 23, 1969)	47.28%	...	1.08%	51.63%
02	How many sectors during Liberation War of 1971 (Eleven sectors of Liberation war 1971)	73.36%	...	2.17%	22.82%
03	What were the titles conferred on valiant freedom fighters? (Four titles conferred on valiant freedom fighters Veer Shersta, Veer Vikram, Veer Uttam and Veer Pratik)	57.06%	17.39%	...	25.54%
04	Who were the Veer Shreshtra? (Correct naming of Seven Veer Shersta)	57.06%	18.47%	...	24.45%
05	Who were the friendly states during Liberation War? (Friendly States, India, Soviet Union and Bhutan during Liberation War 1971)	64.13%	21.73%	1.08%	24.45%
06	Who were the enemy states during Liberation War? (Enemy States Pakistan, China and Saudi Arabia during Liberation War 1971)	46.19%	28.26%	4.89%	20.65%
07	Who is the Father of the Nation? [Respondents' answer naming Father of the Nation Bangabandhu Sheikh Mujibur Rahman)	100%
08	Do you think that Liberation War of 1971 has been the most glorious part of Bangladesh's history?	Yes	No		Did not answer
		86.93%	---		13.04%
09	'Build up fortress in each and every house. With whatever you have, you face the enemy....' In this portion of his historic speech of March 7, 1971, Bangabandhu did not mention about any particular weapon, local indigenous arms and ammunitions. Do you agree?	Yes	No		Did not Answer
		70.08%	2.71%		21.19%
10	Do you think that the curiosities of post-independent generation about of the arms and ammunition of liberation war is inspirational or insulting?	Inspirational	Insulting		Did not answer
		80.97%	2.71%		16.30%

Source: Field Study, 2019

People's leader Sheikh Mujibur Rahman was designated with 'Bangabandhu' on February 23, 1969. One of the questions was 'When Sheikh Mujibur Rahman was adorned with the title Bangabandhu?' 47.28% of the respondents responded with correct date, only 1.08% has given wrong answer and 51.63% did not answer the question (serial no. 1 of Table 5). Respondents were asked 'how many sectors were there during the liberation war?' The responses have been presented in above serial no. 2 of Table 5. Most of the respondents (73.36%) have responded correctly, 22.82% did not respond to the question and only 2.17% have responded wrongly. Serial no. 3 of Table 5 presents the responses on the question regarding 'titles' given by the state for fighting valiantly in the liberation war. 57.06 per cent respondents have been able to respond correctly, 17.39% of the respondents had given 'partly correct' answer. On the other hand, none of the respondents had given 'wrong' answer and 25.54% of the respondents did not answer the question.

Most of the respondents (57.06%) have been able to correctly identify the name of seven Veer Shrestha of liberation war, 18.47% have identify the Veer Shrestha which was partially correct and 24.45% did not answer the question (serial no. 4 of Table 5).

From the above serial no. 5 of Table 5 we found that 64.13% of the respondents have been able to identify the friendly states of Bangladesh liberation war, 21.73% of the responses were partly correct, 1.08% responses were wrong and 13.04% did not answer the question. On the other hand, serial no. 6 of Table 5 has presented the answers of the respondents on the question 'which were the enemy states of Bangladesh liberation war in 1971', 46.19% respondents have correctly identified the countries, Pakistan, China and Saudi Arabia, 28.26% have given partial correct answer, 4.89% have given wrong answer and 20.65% did not answer the question. All respondents have responded correctly when they were asked 'who is the father of the nation?' All 100% respondents have identified the name of Bangabandhu Sheikh Mujibur Rahman as the father of the nation (serial no. 7 of Table 5). Respondents were asked do you agree with the statement, 'The Liberation War of 1971 is the most glorious part of Bangladesh's history (?).'The responses have been presented in serial no. 8 of Table 6. 86.95% respondents said 'yes' and 13.04% did not answer the question. Respondents were asked "In his historic speech of March 07, 1971 Bangabandhu Sheikh Mujibur Rahman said, 'Build up fortress in each and every house. With whatever you have, you face the enemy....' In this speech, Bangabandhu did not mention about any particular weapon, local or indigenous arms and ammunitions. Do you agree?" (serial no. 9 of Table 5)76.08% answered 'yes', 2.71% said 'no' and 21.19% did not answer the question. That means most of the respondents believe that Bangabandhu did not mention about any particular arms and weapons rather he asked his fellow countrymen to use whatever weapons they might have. In response to the question do you think that the curiosity of post-1971 generation about the arms and ammunition of liberation war is inspirational or insulting for real freedom fighter?' 80.97% respondents said 'inspirational', 2.71% said 'insulting' and 16.30% did not answer the question (serial no. 10 of Table 5).

Knowledge of the post-independent generation about Bangabandhu's parents, spouse and own Village

On the question of Bangabandhu's birth place (serial no. 1 of Table 6), 57.60% of the respondents have given correct answer, 2.18% was wrong, and 40.21% did not answer the question. 38.04% of the respondents (serial no. 2 of Table 6) have mentioned Bangabandhu Sheikh Mujibur Rahman's father name correctly and 61.95% did not answer the question.

Table 6. Perception about Some Common Personal Information of Bangabandhu Sheikh Mujibur Rahman and Sacrifice of Life of Bangabandhu's Family Members

Serial No.	Questions on Bangabandhu's parents, birthplace and other important information	Responses			
		Correct	Partly Correct	Wrong	Did not Answer
01	Birthplace and native village of Bangabandhu Sheikh Mujibur Rahman, Tungipara of Gopalganj	57.60%	...	2.18%	40.21%
02	Father's name of Bangabandhu Sheikh Mujibur Rahman, Sheikh Lutfar Rahman	38.04%	61.95%
03	Mother's name of Bangabandhu Sheikh Mujibur Rahman, Saira Khatun	33.69%	...	0.54%	65.76%
04	Name of the wife of Bangabandhu Sheikh Mujibur Rahman, Sheikh Fazilatunnessa Mujib	46.73%	53.27%
05	Identified the persons killed on 15 August 1975 by name	12.50%	...	4.34%	88.15%

Source: Field Study, 2019

33.69% of the respondents (serial no. 3 of Table 6) have mentioned Bangabandhu Sheikh Mujibur Rahman's mother's name correctly and 65.76% did not answer the question. 46.73% of the respondents (serial no. 4 of Table 6) have mentioned Bangabandhu Sheikh Mujibur Rahman's spouse name correctly and 53.27% did not answer the question. 12.5% of the respondents (serial no.5 of Table 6) have been able to mention the name of martyrs of August 15, 1975 correctly, 4.34% have given wrong answer and 88.15% did not answer the question. Respondents were asked, 'Do you think 'Democracy, Socialism, Secularism and Bengali Nationalism' are the ideologies that have similarities with the ideology of Bangabandhu and the spirit of liberation war (serial no. 1 of Table 7). 66.30 % (122) responded 'yes' to the question. On the other hand, 33.70% (62) did not answer the question.

Table 7. Ideology of the Liberation War 1971, Trial of War Criminals and Bangladesh's Development

Serial No.	Questions on ideologies and important information about Liberation War 1971	Responses		
		Yes	No	Did not Answer
01	'Democracy, Socialism, Secularism and Bengali Nationalism' are the ideologies that have similarities with the ideology of Bangabandhu and the spirit of liberation war.	66.30% (122)	...	13.04% (30)
02	Support to the trial of criminals of 1971 war and crimes against humanity	88.59% (163)	2.71% (5)	8.69% (16)
03	The trials of criminals of war and criminals against humanity have become possible due to the fact that Bangabandhu's daughter Sheikh Hasina is on the governmental power.	76.09% (140)	2.18% (04)	21.73% (40)
04	Bangladesh's status as 'role model of development' due to Sheikh Hasina's premiership	76.09% (140)	2.18% (04)	21.73% (40)
05	Respondents' views about the attacks of August 15, 1975 and August 21, 2004 were the consequence of similar conspiracies	48.37% (89)	5.43% (10)	46.20% (85)

Source: Field Study, 2019

Respondents were asked, 'Do you support the trial of criminals of 1971 war and criminals of humanity?' 88.59% respondents said 'yes', 2.71% said 'no' and 8.69% did not answer the question. (Serial No. 2 of Table 7). Respondents were asked Do you agree with the statement (?), 'The trials of criminals of war and criminals against humanity have become possible due to the fact that Bangabandhu's daughter Sheikh Hasina is on the governmental power.' 76.09% said 'yes', 2.18% said 'no' and 2.73% did not answer the question. (serial 3 of Table 7). In response to the question, do you agree with the statement (?), 'Bangladesh has become 'role model of development' in 21st century because Sheikh Hasina is in power.' 76.09% said 'yes', 2.18% said 'no' and 2.73% did not answer the question (serial 4 of Table 7). Respondents were asked, do you agree with the statement that 'the attacks of August 15, 1975 and August 21, 2004 were the consequence of similar conspiracies.' In response to this question 48.37% respondents said 'yes', 5.43% said 'no' and 46.20% did not answer the question (serial 5 of Table 7).

Table 8. Most Recent Noticeable Political Stand (2001-2019) of Anti-liberation Forces and Views on Caretaker Government in Bangladesh

Do you think that the Political Stand (Serial No. 1) of anti-liberation forces during (2001-2019) were	Responses		
(a) Demand for elections under caretaker government	38.04% (70)		
(b) Continuing religion-based politics	1.63% (03)		
(c) Stop Trial of war criminals	0.54% (01)		
(d) Did not answer the question	59.79% (110)		
Respondents views about the researchers on Caretaker Government	Yes	No	Did not answer
Serial No. 2: Respondents were asked, do you think that the researchers who have done their research work in support of caretaker government even after misdeeds of CTG in the elections of 2001 they are actually the intellectual base of anti-liberation forces in Bangladesh?	32.60% (60)	6.52% (12)	60.86% (112)
Serial No. 3: Do you think that recent political development exhibited the fact that the system of caretaker government is against the spirit of liberation war?	24.45% (45)	12.5% (23)	63.04% (116)

Source: Field Study, 2019

Table 8 (serial No.1) presents the data regarding the most recent political stand of anti-liberation forces. Seventy (38.04%) respondents said 'Demand for elections under caretaker government' was the political stand of anti-liberation forces. Only 3 (1.63%) respondents said 'Banning religion-based politics' has been the political stand of anti-liberation forces. 0.54% said 'Trial of war criminals' is the stand of anti-liberation forces. On the other hand, 59.79% did not answer the question. One of the questions (serial no. 2, Table 8) was 'The researchers who have done their research work in support of caretaker government even after misdeeds in the elections of 2001 they are actually the intellectual base of anti-liberation forces in Bangladesh.' Do you agree with this statement? In response to this question, 32.60% (60) of the respondents responded 'yes', only 6.52% (12) said 'no' and 60.86% did not answer to this question. That means a considerable number of Bangladeshi people consider those researchers as belong to anti-liberation camp who have done research in support after electoral catastrophe during the election under caretaker government in 2001. Tables 8 also presents the responses regarding the question (serial No.3, Table 8) in view of the recent political development in Bangladesh do you think the system of caretaker government is against the spirit of liberation war? The number of 'yes' to this question was more 24.45% (45) than the number of 'no' 12.5% (23) to this question. Besides, 63.04% (116) of the respondents did not answer this question.

8. Discussion and Conclusion

The investigation was conducted to find out the state of post-1971 generation about their awareness about liberation war. Bangladesh has become an independent nation-state as a result of liberation war of 1971 under the leadership of Bangabandhu Sheikh Mujibur Rahman. Bangabandhu had created self-awareness among the people, instilled both the spirit and the seeds of the freedom movement in the minds of (East) Bengalis. However, after the killings of August 15, 1975 and Jail killings of November 3 of the same year the assassins and their collaborators have been trying to erase the true history of the country. The popular narrative in this regard is that the killings of Bangabandhu and his family members and the four national leaders were part of the same conspiracy and the "killers wanted to take revenge of the partition of Pakistan". Bangladesh's independence on the basis of Pakistan's partition was inspired by the "Spirit of liberation war". While the supporters of Pakistan's creation were derived by the "spirit of 1947 partition". The post-1975 independent Bangladesh has been witnessing the explicit and implicit conflicts between two spirits, i.e. "Spirit of liberation war" against the "spirit of 1947 partition". We also found the fading away of emotion on the events of liberation war. The post-1971 generation was 'disinterested', and sometimes even 'adverse' towards the whole discourse of 1971.'

The liberation war of 1971 had brought a conclusion of Pakistani sovereignty, existing power relations, political hierarchies and limited political and cultural ties with Pakistan persisted. The inevitable struggle for power in the years following the war, divisions between liberation leaders, and the heavy dependence of governments on political and economic alliances, allowed conservative groups who sided/collaborated with Pakistan during the 1971 war to re-establish a power base and a limited legitimacy. Today, the country is full of aspiring youths, motivational speakers and innovative minds. They are energetic, full of enthusiasm and innovations. The youth population is always the greatest strength when it comes to our country. The youth surely are more powerful as a team than individual strugglers trying to change the world on their own. In independent Bangladesh, to the youth and other generations, freedom is not a utopian concept anymore after the war of '71.

Bangladesh is measured as a developing economy. Yet, almost one-third of Bangladesh's 150m people live in extreme poverty. In the last decade, the country has recorded GDP growth rates above 5 percent due to development of microcredit and garment industry. Although three fifths of Bangladeshis are employed in the agriculture sector, three quarters of exports revenues come from producing ready-made garments. The biggest obstacles to sustainable development in Bangladesh are overpopulation, poor infrastructure, corruption, political instability and a slow implementation of economic reforms.

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*The study was carried out with the research grant of Jagannath University in 2019.

Factors of Food Inflation: Evidence from Bangladesh

Submission: 15-11-2020
Acceptance: 28-07-2022

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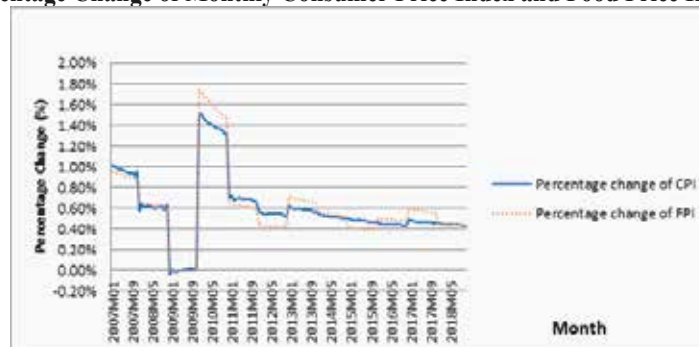
Abstract: Food inflation has become the cruelest tax for the poor and the marginalized in Bangladesh recently. Considering the literature gap, the combined effects of cost-push inflation factors on food inflation in Bangladesh is identified by this study. Additionally, a new transmission mechanism of food prices on non-food prices is also explored by this study. The study findings are triangulated by a mixed method of quantitative and qualitative data analysis. In the quantitative part both multiple and single regression analyses are used. The multiple regression analysis used the explanatory variables as global food price, agricultural wage and fuel price and the dependent variable as food inflation in Bangladesh. The research findings confirmed that the agricultural real wage has a significant influence on food inflation, while the influence of global food price and fuel price is found to be positive but insignificant. In addition the study confirmed the significant positive relationship between food inflation and non food inflation with a single regression analysis where food inflation is the explanatory variable and the non-food inflation is the dependent variable. In this vein, trade restriction, supply chain mechanism and government monitoring etc., emerged as the other relevant factors of food inflation in Bangladesh through the qualitative analysis of the study.

Keywords: Agricultural Wage, Food Inflation, Fuel Price, Global Food Price, Non-Food Inflation

1. Introduction

A sustained increase in food prices may adversely impact the welfare of the poor section of population as they spend a high share of income on food, and would be unable to divert additional resources towards food consumption to offset the effect of high prices. In this connection global food price, fuel price and agricultural wage may impact on food inflation in Bangladesh. The food price index to the general price index in Bangladesh in this regard can be shown in the following trends.

Figure 1. Percentage Change of Monthly Consumer Price Index and Food Price Index in Bangladesh



Data Source: Researchers construction from BBS data

The population unable to meet the basic nutritional needs may emerge as an inefficient cluster of labor force and will become unable to contribute to the GDP of a country with their potential capacity. In spite of the traditional theory that there is a trade off between inflation and growth, evidence shows that such associations are rather elusive and unstable. The rise in prices of food and other necessities put forth upward pressure on general prices both directly and indirectly. In this vein, it is vital to recognize that such price increases have a propensity to persist through inertial momentum, at least for some time (BB, 2008). Empirical evidence shows that the lower income group, whether they are in an agricultural household or not, are severely and adversely affected by food inflation (Fujii, 2013). Making a stable food price level may help Bangladesh to export food and establish a strong position in the export arena of the world. It may also improve our balance of payment in future and hold food security domestically.

The research is guided by deductive reasoning. Exploring the literature review, the research variables are selected for the study. Accordingly, the main purposes of the study are to identify the contribution of some cost push factors to food inflation in Bangladesh and to identify the role of food inflation in non-food inflation. In this vein the specific research questions include the following:

- To what extent does global food price impact on the domestic food price index in Bangladesh?
- To what extent does agricultural wage impact on the food price index in Bangladesh?
- To what extent does fuel price impact on the domestic food price index in Bangladesh?
- How does the domestic food price index impact the non-food price index?

The study follows a mixed method for data analysis. The quantitative data are gathered from the centralized official bureau of the government of Bangladesh and from international think tanks. Regression models are used to interpret the quantitative data. The study scrutinizes qualitative data from a semi-structured questionnaire. The key informants for qualitative data are selected from both researchers and practitioners who have their expertise in analyzing the challenges of inflation in Bangladesh. The study relies on a convenient sampling method for qualitative data collection. Finally, it is believed that the mixed method enables the researchers to show the significance of the factors in food inflation in Bangladesh and the role of food inflation on non-food inflation. The researchers also recommend possible solutions to food inflation in the country.

The remaining paper is structured as follows. In Section 2 the researchers specify the general and specific objectives of the study. Section 3 reviews the theories and literature to identify the key factors driving food inflation in Bangladesh and globally. Section 4 highlights the methodology of the study. Section 5 analyzes how specific factors impact food inflation in Bangladesh through empirical evidence. This section also focuses on the transmission of food inflation to non-food inflation. Finally, Section 6 summarizes the main conclusions of the paper and highlights the key policy recommendations.

2. Objective of the Study

Considering the multi-dimensional effects of food inflation this study focuses on the role of specific factors which may influence food inflation in Bangladesh. The study further focuses on the influence of food inflation in the non-food inflation in Bangladesh. Specifically the following objectives are pursued by this study. Specific Objectives are to:

- a. Identify the influence of global food prices on domestic food inflation in Bangladesh;
- b. Identify the role of fuel prices on the domestic food price in Bangladesh;
- c. Identify the agricultural wage impact on the domestic food price in Bangladesh;
- d. Identify the influence of food inflation on non-food inflation in Bangladesh.

3. Review of Theories and Literature

Complementary and competing theories of inflation give insightful reasons for food inflation for developing countries. In this phase the study explores the theoretical interpretation of inflation across the world before delving deep into the literature. In general, the cause of inflation in developed countries is broadly identified as growth of money supply. David Hume (1711-76) provided the first dynamic process analysis of how the impact of monetary change spread from one sector of the economy to another, altering relative price and quantity in the process (Totonchi, 2011). Totonchi also found that, David Ricardo (1772-1823), the most influential of the classical economists, in contrast thought such disequilibrium effects are transient and trivial in long-run equilibrium analysis.

Irving Fisher (1876-1947) spelled out his famous equation of exchange viz. $MV=PT$. This and other equations, such as the Cambridge cash balance equation, which corresponds with the emerging use of mathematics in neo economic analysis, define precisely the conditions under which the proportional relationship between inflation and other factors is valid (Ruphajivany, 2018).

In the domain of inflation theory the demand side issues also got potential focus. John Maynard Keynes (1883-1946) and his followers emphasized the increase in aggregate demand as the source of demand-pull inflation. In contrast, cost-push inflation is caused by wage increases enforced by unions and profit increases by employers. The basic cause of cost-push inflation is the rise in money wages more rapidly than the productivity of labor (Parkin, 2012).

The major important theories as mentioned above mainly focus on macroeconomic determinants of inflation. The macroeconomic aspects mainly focus on monetary phenomenon, demand and cost driven factors of inflation and structural factors. This theoretical basis helped the researchers to analyze the role of specific factors of food inflation in Bangladesh.

Concentrating on empirical evidence it was clear that the inflation situation of Bangladesh is not satisfactory. Considering 2005-06 as the base year, the national

inflation rate remained persistent from 2015-16 (5.92) to 2018-19 (5.48). During this period the average food inflation was at 5.89 and the non- food inflation was averaged at 5.3 (BBS, 2019; 2020).

Inflation highly affects the middle class. People are compelled to get loans and to do overtime to fulfil their family expenditures due to inflation. The standard of living of middle class people decreases due to inflation because their expenses went up along with minor increases in their income (Farid et al., 2012).

A study revealed that, some short run factors like floods, cyclones, droughts, lack of grain reserves and high oil prices as well as some long run factors such as controlling supply chain through syndication, negligence of agriculture sector, trade liberalization and increasing trade deficit, increasing dependency on import, fluctuations of food grain prices in domestic market and currency depreciation are mainly responsible for rising food inflation in Bangladesh (Saha, 2013).

In this regard the cost of fuel also got attention in raising food prices. A study argues that, biofuel production from grains and oilseeds account for two-third of the price increase in these commodities. Shock from oil prices may affect domestic food prices through various points in its supply chain: production, processing and distribution at both the global and local levels (Mitchell, 2008). Majority of the studies support the existence of an oil-price pass through effect in vertical and horizontal transmission channels (Nazlioglu & Soytaş, 2012). Such as, deregulation of administered fuel price transmits rising fuel prices to fertilizer and transport costs and thus results in cost push inflation (Bandara, 2013).

Empirically, a study analyzed the role of agricultural wage inflation on domestic food commodities inflation, as well as on aggregate food inflation. Their investigation indicates the limited role of fuel and international prices, except for tradable goods (Bhattacharya & Gupta, 2017). Interestingly, this study results suggest significant pass-through effects from food to non-food and to the headline inflation. Another study finds that persistence of food inflation in recent years can largely be ascribed to higher wages, particularly, in the rural sector pushed further by hikes in Minimum Support Price (MSP) of rice and wheat and input cost inflation (Sonna et al., 2014).

Similarly, global food price is another player in the field of inflation of a country. The Food and Agriculture Organization's Food Price Index (FFPI) averaged 97.9 points in September 2020, up 2.0 points (2.1 percent) from August and now 4.6 points (5.0 percent) higher than its value a year ago. The September value, the highest since February 2020, represented the fourth consecutive monthly increase (FAO, 2020). A study in this connection shows that a large set of countries in the world shows that their domestic food processes are influenced by global commodity prices, including future prices (Kalkuhl, 2016). Some have blamed the cost-push pressures emerging from increases in world commodity prices, especially food grain and petroleum (Suma, 2017).

Various studies have been found to explore the individual factors and their impacts on food inflation separately in Bangladesh. In this regard, the joint effects of specific cost

push inflation factors in Bangladesh are the study gap of the existing literature domain. This study accordingly explores the impacts of specific cost push factors on food inflation in Bangladesh. Furthermore, the relative significance of food inflation on non-food inflation in Bangladesh was also a new dimension attempted to be explored by this study.

4. Methodology

To realize the objective(s) of the study, the proposed study uses a combination of both qualitative and quantitative research approaches. The data obtained in qualitative study are used to triangulate the quantitative study for this research.

The quantitative data in the form of secondary information are collected from both public and private institutions. The sources are annual reports and websites of the organizations. They include Bangladesh Bureau of Statistics, (BBS), Food and Agricultural Organization (FAO) of the United Nations and United States Energy Information Administration.

The respondents for qualitative study are selected from the pool of researchers and practitioners from organizations involved in food policy implementation in Bangladesh. Among them the researchers are selected from think tanks include public universities, Unnayan Onneshan, Centre for Policy Dialogue (CPD), Bangladesh Institute of Development Studies (BIDS), South Asian Network on Economic Modeling (SANEM) and Research and Policy Integration for Development (RAPID). The practitioners on the other hand, are the employees of the food policy implementing organizations. They include: Consumers Association of Bangladesh (CAB), Export Promotion Bureau (EPB), Trading Corporation of Bangladesh (TCB), Bangladesh Standard Testing Institution (BSTI) and Bangladesh Food Safety Authority. The purpose of selecting these categories of respondents is to validate the findings of the study with the view of both the researchers and practitioners in food policy issues.

In this connection particularly, the researchers are selected from the university researchers and from the research wing of individual think tanks that have their exposure in macroeconomic policy issues and particularly inflation related studies. In contrast, the practitioners are selected from the implementing organizations from the Deputy Director level or above of the management hierarchy of the organizations. In this regard, a snowball sampling technique is used to select respondents from selected respondents.

In this pursuit equal weight is given to the respondents of two categories. A total of 20 respondents: 10 from the researcher category and 10 (depending on availability) from the practitioner category were selected for collecting qualitative information for the proposed study.

The model specification of the quantitative analysis is introduced in this section. The study period is considered to be 2005 to 2018. The study includes multiple and single regression analysis which is as follows:

$$LNFPI_t = C + \beta_1 LNFPI_{t-1} + \beta_2 LNOP_t + \beta_3 LNAWI_t + \epsilon_t \dots \dots \dots (1)$$

$$LNNFPI_t = C + \beta_4 LNFPI_t + \epsilon_t \dots \dots \dots (2)$$

In equation (1) $LNFI_t$ indicates log of food price index for Bangladesh, $LNGFI_t$ shows log of global food price index., $LNOP_t$ is log of oil price, $LNAWI_t$ represents log of agricultural wage rate index for Bangladesh. In equation (2), $LNNFI_t$ is log of non- food price index and $LNFI_t$ indicates log of food price index for Bangladesh. Here C is used to represent the constant term and ϵ_t indicates the error term for both the equations.

Data have been collected on food price index (FPI_t), non-food price index (NFI_t) (2005 = 100), global food price index ($GFPI_t$) and oil price (OP_t) for the period 2005 to 2018, whereas the data for agricultural wage rate index (AWI_t) has been collected for the period 2005 to 2014. The explanatory variable oil price (OP) refers to the yearly Europe Brent Spot Price (FOB). The oil price (OP) is used as a proxy for world oil prices which is measured in US dollars per barrel.

4. Data Analysis and Interpretation

This part of the study presents both the quantitative and the qualitative results in compliance with the objectives. In order to assess the influence of factors of food inflation it relied upon a multiple regression model. Additionally, it also applied a single regression model to illustrate the influence of food inflation over non-food inflation in Bangladesh. To validate the quantitative study findings, the researchers included qualitative survey results afterwards.

At first the study summarizes the features of the quantitative variables from a collection of secondary information in the following table:

Table 1. Descriptive Statistics of Variables

	Mean	Maximum	Minimum	Std. Dev.	Jarque-Bera	Probability
FPI	188.63	281.33	100.00	57.88	0.876154	0.645276
GFPI	177.11	229.90	118.00	32.22	0.379340	0.827232
NPI	160.15	229.58	100.00	44.28	1.167343	0.557847
OP	77.31	111.63	43.64	23.90	1.278771	0.527617
AWI	5509.20	9254.00	2925.00	2216.66	0.854827	0.652194

Source: Authors' calculation from EViews 8.0.

The descriptive statistics of the variables are shown in Table 1. It shows that the food price index has volatility of 57.88 and has a maximum and minimum of 281.33 and 100.00, respectively. The global food price index has a mean of 177.11, with a maximum of 229.90 while the minimum is 118.00. Non-food price index has volatility of 44.28 and has a maximum and minimum of 229.58 and 100.00, respectively. The volatility of oil price is 23.90. Agricultural wage rate index has a maximum and minimum of 9254.00 and 2925, respectively. Finally, all the variables are normally distributed as p-values are greater than 5%.

To address the objectives, firstly this study finds out how the global food price, oil price and agricultural wage rate in Bangladesh explain the domestic food price in Bangladesh.

Table 2. The Effect of Global Food Price, Oil Price and Agricultural Wage Rate on the Domestic Food Price in Bangladesh

LNFPi	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.686	0.445	-1.541	0.1744
LNGFPI	0.214	0.216	0.989	0.3604
LNOP	0.038	0.176	0.219	0.8339
LNAWI	0.522*	0.072	7.264	0.0003
R-squared	0.9776			
Adjusted R-squared	0.9664			
F-statistic	87.42*			
Prob(F-statistic)	0.0000			

Source: Author's calculations

Note: * denotes significance at 1 percent level.

From the above table it can be seen that both the global food price index and oil price have a positive effect on the food price index in Bangladesh although both effects are statistically insignificant. Holding everything else constant, 1 percent increases in global food price index will increase 0.214 percent of food price index in Bangladesh and holding everything else constant, 1 percent increases in oil price will increase 0.038 percent of food price index in Bangladesh. On the other hand, the agricultural wage rate index in Bangladesh has positive and significant effects on the food price index in Bangladesh. Holding everything else constant, 1 percent increases in the agricultural wage rate index will increase 0.522 percent of the food price index in Bangladesh. The R-squared value is 97.76 percent which indicates that 97.76 percent of the variation in LNFPi in Bangladesh is explained by the variables LNGFPI, LNOP and LNAWI jointly. The F-statistic for this multiple regression analysis is 87.42 and the corresponding P-value is 0.0000. Here the P-value is less than 5 percent. As a result, F-statistic is statistically significant which indicates that independent variables such as LNGFPI, LNOP and LNAWI jointly can influence the dependent variable.

To test the validity of the multiple regression model in table 3, we need to check the residuals.

Table 3. Breusch-Godfrey Serial Correlation LM Test

Obs*R-squared	0.749431	Prob. Chi-Square(1)	0.3867
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Source: Author's calculations.

Null Hypothesis: Residuals are not serially correlated.

From Table 3, it can be seen that the estimated results are not affected by serial correlation problem and calculated value of Obs*R-squared is 0.749431 and the p-value

is 38.67%, which is more than 5% that is statistically insignificant at 5% level of significance. As a result we cannot reject the null hypothesis rather we can accept the null hypothesis that there is no serial correlation in the data.

Furthermore the following Table 4 shows that the estimated results are not affected by heteroscedasticity problem.

Table 4: Residual Heteroskedasticity Tests: Breusch-Pagan-Godfrey Test

Obs*R-squared	5.600951	Prob. Chi-Square(3)	0.1327
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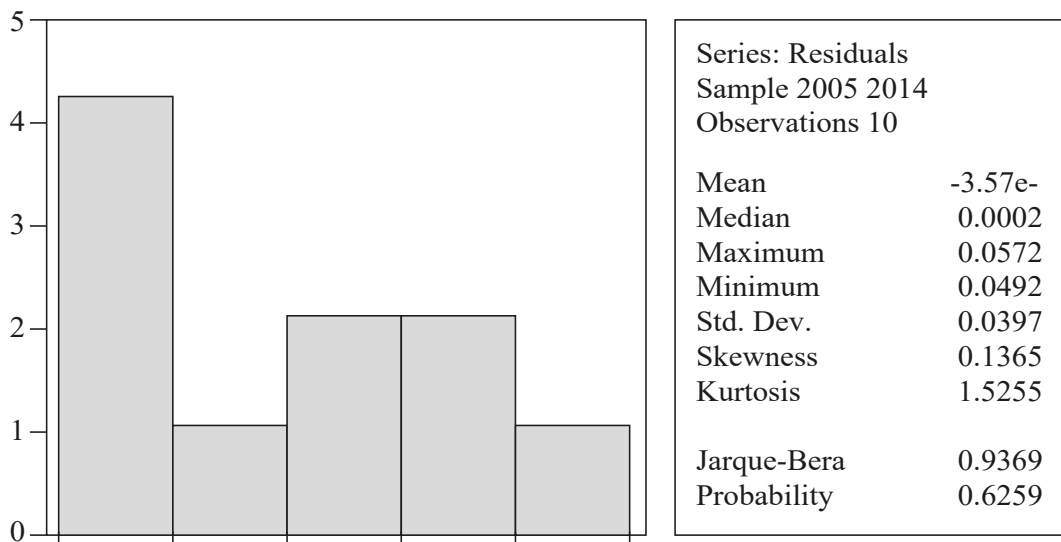
Source: Author's calculations.

Null hypothesis: There is no heteroskedasticity in the data.

In this vein the calculated value of Obs*R-squared is 5.600951 and the p-value is 13.27%, which is more than 5% that is statistically insignificant at 5% level of significance. As a result, we cannot reject the null hypothesis rather we can accept the null hypothesis that there is no heteroskedasticity in the data.

Finally, to check whether the residuals are normally distributed or not, Jarque-Bera and corresponding probability will be tested. It is shown in the following tabular presentation.

Table 5. Normality Test of the Estimated Residuals of the Regression Model



Source: Author's calculations.

Null Hypothesis: Residuals are normally distributed.

From table 5, it can be seen that p-value is 62.59% which is more than 5%. As a result we cannot reject the null hypothesis rather we can accept the null hypothesis that the residuals are normally distributed. From Table 3, 4 and 5, it can be seen that in all cases null hypothesis are accepted and the value of R-squared in table 2 is very high. As a result, it can be said that this model can be used in forecasting.

In this stage of the study the impact of food inflation on non-food inflation in Bangladesh is explained. The second regression in table 6 shows the impact of food inflation on non-food inflation.

Table 6. The Impact of Food Inflation on Non-Food Inflation in Bangladesh

LNNPI	Coefficient	Std. Error	t-Statistic	Prob.
C	0.526	0.154	3.423	0.0051
LNFPPI	0.869*	0.029	29.424	0.0000
R-squared	0.9863			
Adjusted R-squared	0.9852			
F-statistic	865.77			
Prob(F-statistic)	0.0000			

Source: Author's calculations

Note: * denotes significance at 1 percent level.

From Table 6 it can be seen that food price index has positive and statistically significant effect on non-food price index in Bangladesh. 1 percent increase in food price index in Bangladesh will increase 0.869 percent of non-food price index in Bangladesh. The R-squared value is 98.63 percent which indicates that 98.63 percent of the variation in LNNFPI in Bangladesh is explained by the variable LNFPPI.

To test the validity of the regression model in table 6, we need to check the residuals.

Table 7. Breusch-Godfrey Serial Correlation LM Test

Obs*R-squared	1.937574	Prob. Chi-Square (1)	0.1639
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Source: Author's calculations.

Null Hypothesis: Residuals are not serially correlated.

It can be seen that the estimated results are not affected by serial correlation problem and calculated value of Obs*R-squared is 1.937574 and the p-value is 16.39%, which is more than 5% that is statistically insignificant at 5% level of significance. As a result, we cannot reject the null hypothesis rather we can accept the null hypothesis that there is no serial correlation in the data.

The residual heteroskedasticity tests by Breusch-Pagan-Godfrey Test shows the following:

Table 8. Residual Heteroskedasticity Tests: Breusch-Pagan-Godfrey Test

Obs*R-squared	3.945925	Prob. Chi-Square (1)	0.05
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Source: Author's calculations.

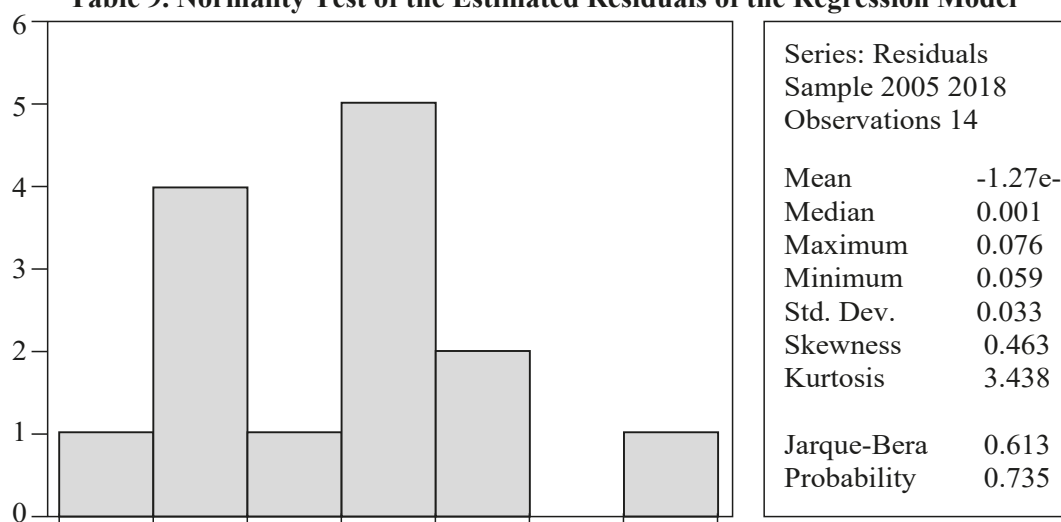
Null Hypothesis: There is no heteroskedasticity in the data.

Table 8 shows that the estimated results are not affected by heteroscedasticity problem and calculated value of Obs*R-squared is 3.945925 and the p-value is 5%, which is not less than 5% that is statistically insignificant at 5% level of significance. As a result, we

cannot reject the null hypothesis rather we can accept the null hypothesis that there is no heteroskedasticity in the data.

The Normality Test of the estimated residuals of the regression model in this stage is as follows.

Table 9. Normality Test of the Estimated Residuals of the Regression Model



Source: Author's calculations.
Null Hypothesis: Residuals are normally distributed.

Finally, to check whether the residuals are normally distributed or not, Jarque-Bera and corresponding probability will be tested. From table 9, it can be seen that p-value is 73.58% which is more than 5%. As a result, we cannot reject the null hypothesis rather we can accept the null hypothesis that the residuals are normally distributed.

From Table 7, 8 and 9, it can be seen that in all cases null hypothesis are accepted and the value of R-squared in table 6 is very high. As a result, it can be said that this model can be used in forecasting.

In this phase of the study the empirical findings from qualitative data are analyzed. The responses of the researchers and practitioners about the influence of global food price, agricultural wage rate and fuel price on food inflation in Bangladesh are explained separately in the following table.

Table 10. Key Informant's Views about Role of Specific Factors on Food Inflation in Bangladesh

Factors of Food Inflation	Researcher's Responses	Practitioners Responses
Global Food Price Index	High	Moderate to high
Agricultural Wage Rate Index	Moderate	High
Fuel price Index	High	High

Source: Researcher's own construction

The study further concentrated on the crucial concepts of the researchers and the practitioners about the other factors of food inflation in Bangladesh. They are jotted down in the following Table.

Table 11. Key Informant's Perception about Other Factors of Food Inflation in Bangladesh

	Researcher's Responses	Practitioners Responses
Other factors of food inflation	<ul style="list-style-type: none"> • Poor Supply chain mechanism • Fiscal policy • Cost of production and marketing • Corruption • Service and manufacturing wage 	<ul style="list-style-type: none"> • Cost of production • Market monitoring • Political unrest • Natural disaster

Source: Researcher's own construction

In this regard, the majority focused firstly on the concern of poor supply chain mechanism of food products in Bangladesh. They specified it by factors like supply of food from China and India, trade restrictions like export ban for the foreign suppliers and import bans for the local suppliers of food, import barriers from non cooperation in Letter of Credit (LC) opening and stock maintenance of Public Food Distribution System (PFDS). Secondly, they identified the administrative inefficiency of the government. In this regard, absence of rule of law, poor level of price monitoring are mostly blamed by the researchers. Thirdly, they mentioned the cost push and demand pull inflation scenario in this perspective. In the cost push inflation, transportation cost, fertilizer price etc., were identified by the researchers. In contrast the wage structure of the manufacturing and service sector, and monetary policy to some extent also responsible for demand pull inflation in the food sector of Bangladesh. Finally, in their view corruption also turned out to be a player. Hoarding of food stock by opportunist businessmen and rent seeking also came in the explanations of the respondents.

In contrast, from the practitioners' perspective cost push inflation got the main focus. As per their experience, transportation cost, cost of fertilizer and pesticides, cost of credit and cost of labor due to urban migration is evident in the field of food inflation in Bangladesh. Similarly they also pointed out natural disaster as a crucial reason for food inflation in Bangladesh. Among other issues they also raised concerns for political unrest, market monitoring which are playing a moderate role in food inflation in Bangladesh. According to them, a lack of market monitoring is responsible for artificial shock and thus a wide gap between producers and consumers in the food supply chain mechanism exists in Bangladesh.

Combining the views of both researchers and practitioners in the field of food inflation it can be said that cost push factors and supply chain mechanism are mainly responsible for food inflation in Bangladesh.

Finally, the study addressed the second objective of the research which is how food

inflation may impact on non-food inflation. It can be portrayed in the following table that major respondents identified the influence of food inflation on non-food inflation in Bangladesh at a high level.

Table 12. Key Informant's Perception about Role of Food Inflation on Non-Food Inflation in Bangladesh

Role of food inflation on non-food inflation	Researcher's Responses	Practitioners Responses
		High

Source: Researcher's own construction

Finally, this section combines both the quantitative and qualitative findings of the research. It is found from the quantitative study that though factors like global food price and oil price have effects on food price in Bangladesh but they are not significantly playing their role. In contrast the agricultural wage rate is found to be affecting significantly on food inflation in Bangladesh. This can be explained by increasing migration from rural to urban and accordingly it may increase the agricultural wage rate. Researchers opined that the sharp upward trend in real agricultural wage testifies the arrival of a Lewis turning point of surplus labor in Bangladesh (Zhang et al., 2013). The authors attributed the rising wages to (i) more extensive job opportunities in the non-farm sector, especially in the manufacturing sector for females, and (ii) a larger amount of remittances primarily from the overseas male workers than before. The qualitative findings of the study also supported this explanation of increasing agricultural wage rate index in Bangladesh.

Since 2004-05, agricultural labour actually declined in absolute terms (UNCTAD data) even though the population and the labour force grew at a considerable pace. Since 2005-06 there was a net migration of labour from agriculture to other sectors (including overseas markets), implying that the latter had to bid away labour from agriculture to feed their needs. Consequently, this period witnessed an unprecedented high rate of growth of agricultural real wages. Moreover, technological improvement in the agricultural sector raised the productivity of labor and it also combined with the reduced labor force in the agricultural sector due to the increased job opportunities in the manufacturing and service sector (Taslim & Taslim, 2018). This can be another interpretation of cost push inflation results from wage inflation in the Bangladesh food sector.

Other empirical evidence can also be presented to validate the study results. For instance it was found that, a 30% hike in international food prices can be translated into an average domestic food price inflation in developing Asia of about 10% ADB (2011). Additionally it was also found that, an increase in oil price declines the economic growth and food security simultaneously and significantly in Bangladesh (Saha et al., 2018).

The qualitative findings also focus on the relevance of the factors like global food price, fuel price and agricultural wage rate index on food inflation in Bangladesh. In this regard the effects of global food price on agriculture turned to be moderate to high and the effects of fuel price (oil price) turned to be high on food inflation in Bangladesh. This

was found from the survey results of both the researchers and practitioners in the field of food security in Bangladesh.

5. Conclusion and Recommendations

The study reveals the role of global food price, agricultural wage rate and fuel price in influencing food inflation in Bangladesh with various extents. Among them the role of global food price and fuel price found to be positive but insignificant, while the agricultural wage rate index effects found to be positive and significant. What is a crucial finding is that their combined effects are found to be significant on food inflation in Bangladesh. Finally, we found significant evidence of transmission of food inflation to non-food inflation in Bangladesh.

The study leaves room for other researchers to explore the field of food inflation in Bangladesh. We need to examine alternative shock-scenarios on food inflation in Bangladesh to address the lack of the existing policy prescriptions. In this vein the pass-through effects of recent macroeconomic indicators on inflation can be compared with that of other countries with which we have more trade relations.

In agreement with the study findings, the following recommendations are made by the researchers:

- Agricultural wages can be controlled by monitoring the price of substitute goods like prices of other agricultural inputs. Additionally, it should be noticed that, in the rural sector the cost of food through the minimum support price of rice and wheat etc., may not further aggravate agricultural wages in the country. Given the limited ability of the government to implement minimum wage policy and the current state of labour demand, a better policy can be taken to buttress demand for labour by expanding the government's employment generation programmes.
- Since agricultural food prices respond positively to any shock from oil prices it would be necessary to diversify the energy consumption in this sector. From too much reliance on fossil fuels to an optimal combination of renewable and non-renewable energy resources will be in favour of not only the energy security but also the food security.
- Bangladesh follows the global trend of inflation to some extent. The estimated pass through elasticities are found to be high for the commodities that are fully imported, for example, edible oil. Importing of food products induces high food prices, because of balance of payment and low value of domestic currency. Reconstruction of the tax system towards a balanced distribution of export and import tariff by the policy makers may help reduce food inflation in the country.
- In the backdrop of rising inflationary spirals worldwide particularly after 2007, a pertinent issue is: what has happened to Bangladesh, particularly to its financial sector. It is important to analyze the impact of inflation on the financial sector as high inflation is likely to affect the credit market by shrinking the supply of loanable

funds and thus may further aggravate the food inflation pressure in Bangladesh through increasing the cost of production of food.

- In this vein the cost - benefit analysis of the government policy projects should be performed so that the appropriate policy prescription will be implemented. In this pursuit the implementing agencies of the government should be properly equipped. It has been seen that though the major responsibility of containing food prices is on the Ministry of Commerce (MoC) of Bangladesh, they have very little power and tools in hand to influence the market prices. Both the power and tools can be ensured by enhancing coordination between the Ministry of Commerce and Ministry of Finance (MoF), in Bangladesh. Thus the government monitoring bodies should be made more empowered if food inflation is to be curbed and thus its impact on non-food inflation can be limited as well.

Finally, the study examined some factors of food inflation in Bangladesh. In doing so it focused on global food price, agricultural wage rate index and fuel price index. The study identifies their separate and combined influence on food inflation. It also highlighted the capacity of food inflation to influence non-food inflation in Bangladesh. Accordingly, the prescriptions of the study may help the policy makers to make a consistent food policy including the issues of trade restriction, supply chain mechanism and government monitoring capacity which are found to be dominating factors in ensuring food security in Bangladesh.

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Buriganga Pollution and Its Impact on Human Health: An Empirical Study

Submission: 10-03-2021
Acceptance: 28-07-2022

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Abstract: *City life in Dhaka initially started on the bank of river Buriganga, which subsequently, had developed and expanded over time centering on the river. However, pollution in Buriganga has become an issue of concern over the last few years. This study aims to explore why and how river Buriganga has come to this current situation and what are its ultimate effects on human health. The article seeks to address these questions by resorting to the qualitative method. Respondents were selected through random and purposive sampling, and data was collected using key informant interviews, unstructured and intensive interviews, case studies, and Focus Group Discussion (FGD) methods. The paper revealed that Buriganga becomes a source of polluted water because of wastes (mainly plastic and discarded polythene) dumped by households, industrial units, and other riverside institutions. Also, the grabbing of various parts of the river by influential persons and institutions did help the cause of Buriganga pollution. Due to such conditions of Buriganga, people living on its shore have been facing different health issues, including suffering from skin diseases, water-borne diseases, stomach diseases, nose-ear-throat diseases, respiratory diseases, eye problems, and insect infestation related diseases, along with other health complexities. It is expected that the study will help policymakers to make necessary policies to reduce Buriganga pollution and prevent the consequent health problems of the people living adjacent to the river.*

Keywords: Buriganga river, Grabbing, Health hazards, Insects' infestation, Pollution

1. Introduction

If we want to know about the damage to Dhaka's surrounding environment, we have to look at the condition of the Buriganga river from an explorative point of view. It is evident that after grabbing the land from two sides of the river, people have destroyed the beauty of the river. Once filled with the swarm of hilsa fish, the river has now become a dying bin of waste. The city life of Dhaka started during the Mughal reign in 1608, variably through 1610 (Shafiq, 2000). Like other cities of that time, Dhaka had developed on the bank of the river Buriganga; with the development of internal communication systems, it has spread gradually northwards from the banks of the river that is still going on. The river used to be the lifeline of this ancient city as its industries and trade system were based on Buriganga (Shafiq, 2000). Even in current times, Sadarghat is the main entry point of Dhaka from different regions of the country, especially the southern parts.

From the banks of the Buriganga, various cottage industries began to flourish during the Mughal reign, and different localities were named by community-based occupations, like Shakhribazar, Tantibazar, and Kumartuli, for this reason. Besides these, some industrial factories were introduced in this country with the efforts of foreigners also. First, the Dutch established a factory in 1663 in the Tejgaon area; later, many factories were founded on the river bank (Shafiq, 2000). Once the territory was famous for its wheel, iron, copper, brass, weaving, perfume, shell, soap, oil, and other industries, and most of these factories developed centering on Buriganga (Shafiq, 2000). Later on, tanneries, dyeing factories, plastic products, and other industries were established in this city, and factories had dumped the wastes directly into the river. Moreover, the sewerage system of the City Corporation is linked directly to the river. Due to all these reasons, the river has become heavily polluted. In the present situation, it can be said that Buriganga is the name of a river that has stopped flowing and is attacked by factories and human settlements. However, the river has immeasurable importance in maintaining the balance of the relationship between the local population and the environment. Thus, when this river gets polluted, it hugely affects the lives of the people living around her, especially their health. In this context, this article explores the causes of the pollution of the river Buriganga as well as its impact on the health of the people living in the vicinity of the river.

2. Objectives and Importance of the Study

The increasing population in Dhaka and its high land prices have enticed influential people to occupy the riverside areas. As a result, Buriganga has turned out to be the only place to dump household wastes (BAPA, 2010; Shafiq, 2000). Because of the discharged wastes of the city spreading into the river, many aquatic species have died, and people living near the river are suffering from skin diseases, stomach ailments, nose-ear-throat problems, lung diseases, mosquito, snake and rat infestations, etc. (BAPA, 2010; Shafiq, 2000; Alam, 2000b; Shahnaz, 2000). The present state of pollution in Buriganga and its adverse consequences on human health has become an issue of great concern for researchers and policy-makers alike. Even the River Act and mass awareness attempts of the government have failed to ease river pollution and land grabbing. Therefore, the question that makes these researchers more interested is why even after taking steps, it is not possible to reduce the level of encroachment and pollution in Buriganga and the health challenges of the people living along the river.

In this context, this research aims to: (i) Investigate the reasons behind Buriganga's pollution; (ii) Unveil the nature of the land grabbing history of this river; (iii) Focus on the impact of pollution on the health of the people living near Buriganga.

3. Literature Review

The issue of river pollution and its effects on human health has been the subject of various literature. Shafiq (2000), for example, mentioned that the inhuman activities of human beings had destroyed the beauty of Buriganga. He also reported that the land surrounding this river is grabbed by some politicians, government officials, retired

military officers, local business persons, wholesalers, uprooted people, and people from other parts of the city. The occupied land has been utilized for construction of buildings, houses, industries, and slums. Further, the tannery industry in the vicinity highly polluted the river. There are about 200 tanneries beside the river; these factories discharge 4.75 million liters of contaminated water and 95 metric tons of solid and toxic wastes every day, which pollute the river water. He further said that settlements had been built in the *Kamrangirchar* area by occupying Buriganga. Thousands of houses, multi-storied buildings, factories, mosques, madrasas, offices of political parties, and hanging latrines have been constructed here. The author discussed some ideas about the encroachment and causes of pollution in Buriganga, but the paper mentioned nothing about the impact of pollution on human health. In the context of grabbing, Alam (2000) sheds light on government industrial organizations. Such as, Bangladesh Inland Water Transport Authority (BIWTA) initiated the occupation of Buriganga in Dhaka. Since 1952, the organization has leased land to various individuals and organizations on the pretext of maintenance responsibilities on about 400 yards of land on the banks of this river. In this case, the officials of the government institutions play a significant role in occupying the river by satisfying their vested interests through bribery (Alam, 2000a). He identified the sewerage of Rayer Bazar, Dolaikhal, and Paglaya and waste from Hazaribagh tannery and Tejgaon Industrial Area as the prime sources of Buriganga pollution. The polluted water became the bearer of cholera, typhoid, dysentery, hepatitis, and other diseases, especially in the dry season as the river water recedes; these diseases spread to humans (Alam, 2000b). Although this paper describes how the government and private organizations were responsible for water pollution in Buriganga, which resulted in spreading diseases, it does not explore how the people living nearby the river interact with the contaminated water. Similarly, Shahnaz (2000) shows how and why Buriganga water gets polluted. She also explains in detail how polluted water damaged animal bodies and aquatic life in Buriganga. But there has been little discussion of its effects on human health. In another paper, Haque (2012) identifies three reasons for the current plight of rivers in Bengal, namely river filling, river grabbing, and river pollution. He showed that encroachment, filling, and pollution constricted the river, and when it became small, the opportunists built houses on the river land as they wished. He reported that the water of the Buriganga is so polluted that the Dhaka Water Supply and Sewerage Authority (WASA) can treat only 0.12 billion cubic meters of sewage out of the 1.7 billion cubic meters of sewage per day in the metropolis. The remaining is being dumped into the river without any treatment. As a result, the rivers of Dhaka, Narayanganj, and Munshiganj areas are becoming polluted, and no aquatic life can survive here. Although he discusses the occupation and pollution of the rivers, his work does not reflect its impact on human life, especially human health. Paul (1999) states that when contaminated water enters the human body, bacteria, viruses, parasites such as protozoa, and worms consequently enter the human body and spread various diseases, including typhoid, hepatitis, and dysentery. He further added that the indirect effect of river pollution is the spread of fly and mosquito breeding, which results in a number of diseases. However, the paper did not discuss how much risk to human health is posed by the contaminated water of Buriganga.

4. Theoretical Underpinning

It is essential to have a theoretical framework in social research, which makes the subject matter of the study easy to understand and makes the obtained data meaningful. Therefore, considering the subject matter and objectives, there is a need to analyze the pollution of Buriganga by linking this research with the anthropology of the environment. To encapsulate human beings' interaction with the specific natural environment, the framework of human ecology can be very effective.

Human ecology, in general, is the study of the relationship between human beings and the environment in different cultural contexts (Bhandari, 2008: 17). It also provides a better understanding of the factors affecting this interaction. The integrated framework of human ecology helps to understand the interactions between humans and the environment where they inhabit (Bhandari, 2008: 17). Thus, we can say that human ecology provides a perfect ground to understand the interaction between Buriganga and the people living in its vicinity.

The political ecology can be an effective tool for understanding and investigating the causes of Buriganga river pollution. Its primary characteristic is that environmental issues are not apolitical; political and economic agendas can be masked by a seemingly neutral language of scientific objectivity (Palmer, 2020). In a significant study of political ecology, Piers Blaikie and others (cited in Palmer, 2020) show that the causes of soil erosion were not the same as state government alleges factors like overpopulation, bad farming practices, and environmental stresses. They argue that state policies coerced farmers into capitalist economic systems that stimulate unsustainable farming practices. The persons and organizations responsible for Buriganga river pollution have a strong political connection. From this point of view, we can say that Buriganga pollution also is connected to national politics and the larger context, which needs interpretation. Though Political ecology helps to understand the causes of river pollution, explaining the impact of river pollution on human health factors like disease, illness, and infestation needs to be assessed. By which process, why, and how these factors affect people needs to be explained. These issues are interrelated, and also ecological adaptation is linked with these, so the points mentioned above merit consideration.

5. Research Methods

We selected the East Rasulpur area of Kamrangirchar as the study area, which is under the jurisdiction of Dhaka South City Corporation. East Rasulpur is a sandbar or attached land to the riverbank known in Bengali as *char* of this section of the river, which is very close to Dhaka city. Many lower-middle and lower class families stay here, and many of them live on doing various jobs in Dhaka. At the same time, there are people of different professions, including boatmen, fishermen, washermen, etc., whose livelihood is connected directly to the river. Thus, this area has chosen to understand the reality of Buriganga river pollution and the health hazards of the residents for using or coming in contact with the polluted water.

For primary data collection, 29 informants were selected through systematic random and purposive sampling techniques. Among these respondents, 65 percent (equals to 19) were

residents of East Rasulpur picked up as samples by following random sampling, and the rest, 35 percent (equals to 10) of respondents who lived in different parts of the city, were selected through the purposive sampling technique. Through the observation tool, an attempt is made to get a primary idea about various issues, including river pollution and the types of diseases. The assistance of 2 key informants has been taken in conducting fieldwork to ensure the proliferation and depths of the data. The unstructured interview method is used to collect detailed, in-depth information; so that the respondents of the East Rasulpur area can provide their opinions freely. For this study, intensive interviews were conducted with 2 doctors, 1 personnel from a pro-environmental organization, and 2 politicians to get primary qualitative data. Keeping eyes on the objectives, the case study tool has been used to present an accurate explanation of the causes of river pollution and consequent health problems. An FGD of 7 respondents of different professions in East Rasulpur has been conducted to gather more information on river pollution and health hazards in less time and verify the collected data.

6. Buriganga: Causes of Pollution

The location of the East Rasulpur area is very close to the tannery, and for this reason, the water of this part of Buriganga pollutes through various wastes. Ninety-five metric tons of solid waste and 4.75 million liters of polluted water are discharged daily from the tanneries (Shafiq, 2000). *Paribash Bachao Andolon* (POBA) shows in their research that the tanneries of Hazaribagh pass 21,000 cubic meters of waste in the river. These wastes are chromium, lead, sulfuric acid, animal meat, etc. The toxic liquid and solid wastes of tanneries pollute the soil and air on the banks of the river with water (POBA, 2014). Although the shifting process of the tanneries from the shores of the Buriganga has begun, some tanneries are still operating and trying to delay the relocation process on various pretexts, so the river pollution continues despite different initiatives taken by the government.

The most mentionable reason for water pollution in Buriganga is household waste (Shafiq, 2000; POBA, 2014). The garbage of many houses in East Rasulpur is being dumped directly into the river; even the leftover garbage of marriage houses and community centers are being thrown into the river water. Somewhere industrial waste and household waste are falling into the river water through pipes. Sewerage pipes are connected to household waste pipes at several sluice gates, adding excreta to river water. The color-mixed waste of the factories also can be seen falling into the river through a few sluice gates. In this regard, respondent Malek Uddin¹ The Pseudonym of the informants has been used in this research paper said most of the households and shops in this area directly dumped the waste into the river. It is very tough to live in this area due to the acute pollution. The general secretary of Bangladesh Poribesh Andolon (BAPA) MA Matin said that apart from household waste, the toilet lines of many houses are also connected to the drainage of households; as a result, the river water is easily getting polluted. In addition, there are numerous hanging latrines on the canals on the banks of the river; these excreta are directly polluting the water of Buriganga.

Three markets, namely, *Bou Bazar*, Roni Market, and *Matabbar Bazar*, are located in the

¹Pseudonym of the informants has been used in this research

vicinity of Rasulpur, when the unsold raw materials of all these markets get spoilt; they are thrown into the river. In this matter, respondent Jamal said that all vegetables are not always sold in a day, many unsold vegetables rot, and he dumped these into the river. He also said that since the market is on the river bank, all the garbage of the market is dumped in the river. As a result, water pollution and incidence of disease are higher in the area compared to other parts of the river.

Due to dozens of motorized boats traveling, large quantities of oily substances are seen floating in the section of the river near East Rasulpur. In this regard, boatman Taslim Bepari said that the burnt oil-mobil of most of the launches and trawlers' engines are dropped into the river. As a result, oil and mobil float in the river water. The river is polluting in this way too. As a result of these substances, various aquatic species are becoming extinct, and many insects, including fish, are dying.

We have found the existence of plastics, polythene, and shoe factories beside Rasulpur. All the leftovers from these shoe factories, polythene, and plastic factories are being dumped directly into the river water, which is polluting the river water and filling it very quickly with plastic and polythene. Even the polythene used in households is dumped in the river. Polythene molecules are tightly packed; the tiny fungi or bacteria cannot get inside, so polythene does not break down and turn into any other substance. Since it is not a perishable product, it can remain the same for hundreds of years (Shabuj, 2000). Due to the harmful effects of polythene, the Government of Bangladesh banned the use of polythene products in 2002 (Islam, 2004). Yet, the widespread use of polythene is going on. A resident of East Rasulpur Abdul Hoq said in this regard that discarded polythene from the markets of this area was dumped into the river. He also added that we use polythene and plastic bags every day for many purposes and throw them into the river after fulfilling the requirement. These plastic bags and polythene have accumulated in various drainage systems, disrupting the flow of sewers and rainwater (BAPA, 2010). The Sewerage line of East Rasulpur, connected with the river Buriganga, has been blocked by polythene and obstructed the flow. Abandoned polythene also falls into the water of the Rasulpur area of Buriganga and destroys the normality of the river.

During the dry season, the water flow in Buriganga decreases and pollution becomes more acute. At this time, various types of garbage started to burn, and even the cover that was formed by the accumulation of waste on the water of Buriganga was set on fire. The fire burns above the accumulated garbage, and underneath, the water flows, and after burning down, all the remains fall into Buriganga's water.

In the East Rasulpur area at *Bou Bazaar Ghat*, City Corporation dumps about 20 vans of waste every day. Boatman Anich (50), a resident of East Rasulpur, says waste materials were thrown here some days ago. These wastes increased bad smells around here, and these are going directly to the river. For these perishable wastes of the house, people have stopped moving through *Bou Bazaar Ghat*. Garbage of 56 No. ward of Dhaka South City Corporation is being dumped in the vacant area around the river in the research location. When the empty spaces along the river are filled with garbage, the cleaners of the City Corporation are dumping waste in other empty places; in this way, river water is polluted. The POBA

mentioned in a survey that the amount of sewage in the Dhaka metropolis is 1.3 million cubic meters, of which 1.2 million cubic meters with refining capacity and the remaining 1.25 million cubic meters are falling directly into the river in untreated conditions. So it is seen that some part of the untreated waste is floating in the river water, and other is mixing in it; in consequence, the quality of water is deteriorating (POBA, 2014).

In the vicinity of East Rasulpur near *Kamrangirchar*, along with a 35-bed hospital and number of clinics have sprung up, the waste of these health institutions pollutes the water of Buriganga. Patients' clothes are washed in the river, and their used syringes, saline, excrement, blood, etc., are dumped into the river water. On the one hand, these wastes pollute the river water, and on the other hand, germs of infectious diseases, including waterborne diseases, are spreading through the water.

There are unplanned bridges and poles of power supply in the river in the research area. These also can be considered causes of river occupation and pollution. For the above reasons, the water of Buriganga becomes polluted and unusable, and its aquatic life is in peril.

7. Health Hazards Caused by Buriganga Pollution

People living closer to polluted water and garbage are exposed to skin diseases. Factors like alkalinity of the water and the presence of micro-organisms like bacteria, viruses, protozoa, and other pathogens are responsible for different kinds of skin diseases (Halder and Islam, 2015; Aiyeyun, 2019). Most people of East Rasulpur are from the low-income group who come in contact with the river for various needs, so they have a higher chance of getting infected with skin diseases. Itching is one of the most common skin diseases of the inhabitants of the research area, but respondents call it *khauji* in their local language. A person with *khauji* disease develops rashes and sometimes blisters in different parts of the body, which are itchy; when pressed, a watery substance or ooze comes out, and the skin of the affected area also becomes red. This skin irritation is more common in areas of the body that are always wet, such as: near the elbows of the hands, above the ankles, the backside of the knees, above the neck, and near the waist. In this matter, respondent Ali (60), a boatman, said that the water of Buriganga is so toxic that if it touches any part of the body, that place becomes very itchy and gradually becomes a sore. Though almost all the people living here are more or less infected with this skin disease, people working in factories, who involve in cleaning garbage, *tokai*, Tokai² is a Bangladeshi cartoon character, but it has become the colloquial synonym for the waste collector, street children or dumpster divers and boatmen are comparatively more affected by it. For this *khauji* disease, the skin of the feet of many peoples has become sensitive and leaky; on the other hand, some people have small spots and scratch marks on the skin.

Most of the people of East Rasulpur living near the river area get a kind of wounds such as Frankel, and Carbuncle on their hands and feet. In the local language, this disease of the hand and feet is called *pachamina*. Females are more affected by this disease than males, as most women are engaged in household work and use water almost all day. Respondent Achma (34) said, 'I am involved in household activities; suffer from this disease almost year-round. But in the rainy season, when water is applied to the space between the fingers, the skin becomes thin, and the resulting foul odor comes out from time to time for

²Tokai is a Bangladeshi cartoon character, but it has become the colloquial synonym for the waste collector street children, or dumpster divers.

pachamina disease.' Another respondent Rahima (40) said- 'I have to be in contact with waste and dirty water most of the time as I am doing household work in my own and others' houses. As a result, in the rainy season, and even in the summer, various wounds were seen on my hands and feet, and these constantly bleed.' Again, those who work outside, especially boatmen or those who work in the water, have *pachamina* disease under the legs and between the toes. In the rainy season, the toes turn white due to this disease. During the dry season, this disease of *pachamina* dries out quickly; as a result, the affected place ruptures, and blood comes out when it is slightly injured.

Children are also suffering from skin diseases. As there are not enough playgrounds, young boys and girls play on the banks of the Buriganga; because of this, they are affected by a kind of rash-like red spots that itch on their bodies. The locals call this health problem *luti*. Younger boys and girls, especially those between the ages of 6 to 8, become much affected by *luti*. Several respondents said that young boys and girls were playing close to the river; and sometimes, they come in contact with contaminated water. As a result, small red spots were developed on their skin, and after a day or two, these red spots turned into *luti*. They said that if any children become affected by this disease, then every child in that area is at risk of being infected. The number of children affected by *luti* is increasing day by day due to the polluted water of Buriganga.

Most of the respondents use the water supplied from WASA by boiling it or purifying it through tablets, alum, or filters, but some drink and use it for other purposes without any purification. No one drinks the river water or uses it for food preparation; the people of East Rasulpur use river water for various needs, including washing clothes, washing hands, and feet, bathing, washing dishes, etc. As a result, the people living here face different health problems, including stomach ache, diarrhoea, dysentery, cholera, jaundice, typhoid, etc. Somewhere the land obtained by occupying the river is being filled with sand, the road construction work is going on, so the amount of dust in the houses in this area is more. Meanwhile, various food shops, tea stalls, and *phuchka*³ shops are situated beside the roads in dust-laden air. The foods of these stalls are not safe for health. The Possibility of getting infected with various diseases, including stomach aches and diarrhoea, is being increased by eating these foods.

Those who live near the river bank, most of them are suffering from nose, ear, and throat problems. Especially Children are affected by issues related to ears because they go to the river for a bath and do sports, and as a result, contaminated water goes into their ears, which adversely affected the health of their ears.

The use of river water is also causing eye problems, especially for workers and boatmen who have to stay in touch with the river. Sometimes, unconsciously they wash their face and clean their hands and feet with the river water. When this water comes in contact with the eyes, it burns and causes eye problems. Their idea is that if the dirty water of the river touches the eyes, they might lose sight quickly.

Excessive dumping of garbage in the river causes it to rot, and a rotten stench comes out. Breathing in this foul-smelling air often causes dizziness in some people, which is called

³Type of Indian snack, which is very popular in Bangladesh.

jhimani in the local language. This disease is increasing in course of time due to pollution and stench. And the elderly are having more difficulty in this condition because they can't get out of the house very much. Also, many people vomit while eating due to the bad smell. For people who live near the river, vomiting and dizziness have become a matter of concern.

Smoke is often generated in the East Rasulpur area as fire has been set on the accumulated garbage on the banks. This fume increases the chances of various airborne diseases, including lung infections, because it contains large amounts of ultra-fine carbon particles, hydrogen sulfide, and other toxic gases, hydrocarbons, soot, and tar (Paul, 1999). Hydrogen sulfide is responsible for coughing and irritation in the throat, and lead can act as a sensitizer to coughs, respiratory tract irritation, and asthma (Halder and Islam, 2015). The burning of waste created a fog-like condition around this area; as a result, the residents and pedestrians of this area have to fall into an uncomfortable situation. Healthy people also suffer from dyspnoea⁴, and the chances of contracting various diseases, including lung cancer, have increased. A doctor of the Kamrangichar 35-bed hospital said that smoke from the burning of household waste thrown into the river is very harmful to health. Smoke is the main reason for lung diseases, especially fatal diseases like tuberculosis. The pollution level is such that the common cold and cough of the people living here do not want to be cured easily.

8. The Increased Infestation of Insects and Associated Health Problems

Mosquito breeding is getting out of control due to the favorable environment for breeding in polluted water. Many inhabitants of the East Rasulpur area keep burning coils even during the day to address the mosquito issue, but it is not working. So they are suffering from various diseases, including malaria, dengue, and lymphatic filariasis. Female *Anopheles* mosquitoes cause malaria, *Culex* mosquitoes cause filariasis, and *Aedes* mosquitoes cause dengue and yellow fever (Paul, 1999). Another harmful insect like mosquito is a bug. For the unclean and unhygienic environment, the area is more infested with bugs than other areas. It is not possible to get away from these pests even by applying different insecticides. Bites of this insect can cause scars all over the body that are constantly itching and often turn into incurable skin problems.

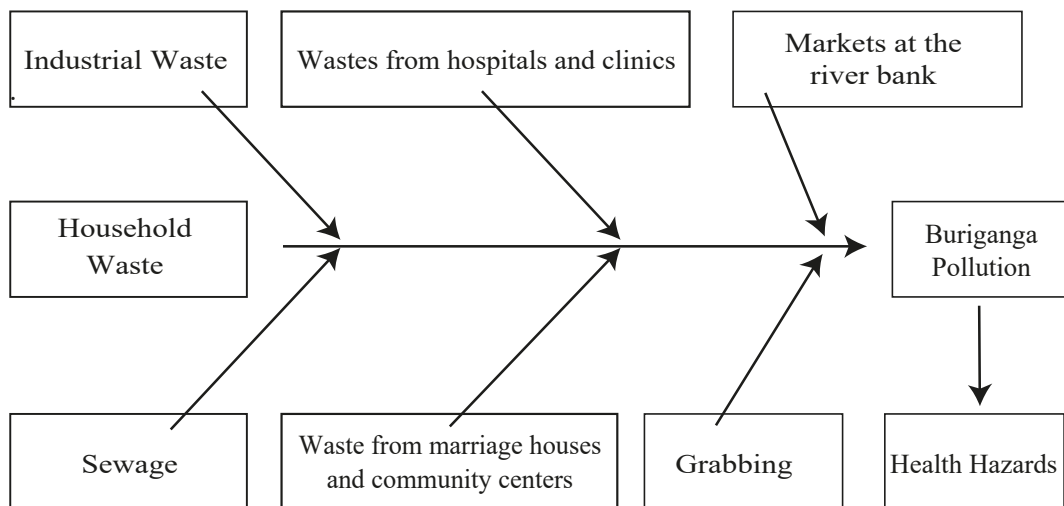
Garbage piles and weeds grow under the *tong*⁵ (house) houses in East Rasulpur. That's why snakes and rats can easily make holes there. Rat's nuisance increases, especially at night, when the rats move over the tin-shed houses at night, making noises that cause sleep disturbances to the residents. As a result, their mood often becomes irritable. There may be plague disease, fever caused by rat bites, and contamination of human food by rat excreta (Paul, 1999). The excessive presence of this creature also raises the risk of various diseases. Again, people always feel scared because of the snakes, mainly during the rainy season. A boy of East Rasulpur was recently taken to the hospital after being bitten by a snake, and he, however, recovered later. But after this incident, the inhabitants became terrified. Respondent Mina (44) says that 'snake attacks are rare in winter, but which are visible at this time become very poisonous. In the rainy season, snakes are found here and there in houses. For it, some people do not stay at home in the rainy season.' The daily lives of people become hampered by snakes and rats, and at the same time, the chances of getting infected with various diseases are increasing.

⁴Dyspnea is a medical term that refers to shortness of breath

⁵Tin-nade nats locally known as tong Ghar

From the above discussion, it can be said that residents of the East Rasulpur area suffer from different kinds of diseases due to water pollution. But it varies according to different seasons; generally, they are most affected in the summer and winter.

Figure 1: Buriganga Pollution: Causes and Its Effect on Human Health



Source: Developed by the authors

9. Conclusion

Pollution in Buriganga in recent times has become a disconcerting issue as it has threatened the very livelihood of the people around the river. The river is being occupied and tainted by constructing bridges in some places, installing electric poles, unplanned factories, building houses, and dumping garbage from Dhaka South City Corporation. The river Buriganga is also being polluted by household waste, the waste of the public market, fuel oil emitted from launch trawlers, the garbage of hospitals, clinics, and industrial wastes. The study tries to find the causes of this pollution and its impact on human health. Taking East Rasulpur as the study area, the current research reveals that most people of this locality are affected by various diseases from the contaminated water of the river. They have to face different skin diseases, water-borne diseases, stomach aches, diarrhea, nose-ear-throat problem, lung problems, dyspnoea, dizziness, etc. It is evident that the river Buriganga is shrinking day by day, and somewhere it has simply turned into a narrow canal of dirty water; there is a possibility of it turning into a dead river in the future.

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Determinants of Life Expectancy: A Panel Data Analysis of Selected South Asian Countries

Submission: 19-04-2022
Acceptance: 28-07-2022

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Abstract: *This paper examined the determinants of life expectancy in 5 selected South Asian countries. Pooled, Fixed Effects and Random Effects panel data models deployed to analyze the data for the period of 2000 to 2014. The research work employed F-test, BPLM test, Hausman Specification test to choose the better and appropriate model for the inference. The results of the tests indicate that the Fixed Effects model is appropriate for the equation of economic variables and the Random Effects Model is more appropriate and better model for the equation of non-economic variables. In view of the above, our result is based on FGLS model estimation due to heteroskedasticity, auto correlation and cross-sectional dependence problem. The findings are gross domestic product per capita, sanitation services and drinking water services have positive significant impact on life expectancy while urbanization has significant but negative impact on life expectancy in selected South Asian countries over the period of the study. Health expenditure and carbon emission are found insignificant variables to explain life expectancy. The paper concluded that gross domestic product per capita, urbanization, sanitation services and drinking water services are among the determinants of life expectancy in selected South Asian countries. Based on the findings the paper recommends that these countries should focus on increasing GDP per capita as well as economic growth. These countries should formulate and implement policies and programs to improve sanitation services and easy access of drinking water services.*

Keywords: Heteroskedaticity, Life Expectancy, F-test, CO₂ Emissions.

1. Introduction

Life expectancy at birth is defined as how long a new born child can expect to live, on average, if current death rates do not change. In other words, Life expectancy (LE) at birth refers to the number of years a person is expected to live based on the statistical average. Life expectancy or longevity is the most prominent social determinant of economic development. In developing countries, sustainable development requires a maintained, expanded and improved health of the human population. These gains in longevity of life can be attributed to a number of factors including rising living standards, greater access to safe drinking water, improved lifestyle and better education, and greater access to quality health services. Other factors such as better nutrition, sanitation and housing also play a vital role in this regard, particularly in countries with emerging economies. In another sense, healthier individuals increase their incomes by being more productive, physically more energetic and mentally more robust. They can increase their earnings through education levels and tend to invest more in their skills. A study on LE of developing countries reported that socioeconomic factors like per capita income, education, health expenditure, access to safe water, and urbanization cannot always be

considered as the determinants of LE (Kabir, 2008). It has been established that the relationship of these factors and LE is not certain and has a wide variety from country to country specially in the South Asian countries. Though the countries of this region are less developed and political instability, militant violence, and communal riot are common affairs here, the LE has been increased by almost 28 years from 1960 to 2020. Therefore this paper quantifies the impact of gross domestic product, current health expenditure, urbanization, sanitation services, drinking water services and carbon emission on life expectancy in selected countries Bangladesh, India, Pakistan, Nepal, Sri-Lanka of South Asian. The objective of the paper is to investigate the influential determinant of life expectancy.

2. Review of Literature

So many studies have been conducted for individual countries or grouped countries like OECD countries, South African countries, Mediterranean regional countries etc. But no study was conducted on determinants of LE for South Asian countries. So I want to fill this gap with this research work. Mahmud et al. (2013) investigated the impact of life expectancy on economic growth and health care expenditure in Bangladesh from 1995-2011. Using multiple regression models, it is found that the higher GDP per capita was seen in a longer life expectancy and one dollar increase in GDP per capita will change in an average the life expectancy by 33 days and also one unit increase in per person health expenditure per capita will increase the life expectancy in an average of 8 days in a year. The higher proportion of total expenditure on health as a percentage of GDP and direct personal expenditure on health as household as a share of private expenditure on health results in also longer lifespan. Torres, Canudas- Romo & Oeppen (2019) examined the contribution of urbanization to changes in life expectancy in Scotland from 1861-1910. The study showed that, besides an urban penalty (higher mortality in urban areas) an urbanization penalty (negative effect of population redistribution to urban areas on survival) existed in Scotland during the study period. In the absence of the urbanization penalty, Scottish life expectancy at birth could have attained higher values by the beginning of the twentieth century. Jeuland, Frente, Ozdemie, Allaire & Whittington (2013) analyzed long-term dynamics of mortality benefits from improved water and sanitation in less developed countries. Using country-level projections in developing regions over a long-time horizon (1975-2050), the study found that, steady and substantial improvements in wash coverage and declining mortality rates across many developing regions, namely East Asia and the Pacific, Latin America and the Caribbean, Eastern Europe and the Middle East. The economic value of potential health gains from eliminating mortality attributable to poor water and sanitation has decreased substantially, and in the future will therefore be modest in these regions. Zhou, Bandara and Paramati (2020) assessed the impact of sanitation, safe drinking water and health expenditure on infant mortality rate across 84 developing countries by using annual data from 1995 to 2013. The findings of this study establish a significant long run equilibrium association among the variables.

The long run elasticity on infant mortality suggests that improved water and sanitation services, health expenditure and per capita income substantially reduce infant mortality rate, while food deficiency increases. Amuka, Asogwa, Ugwuanyi, Omeje and Onyechi (2018) investigated the climate change and life expectancy in a developing country: evidence from greenhouse gas (CO₂) emission in Nigeria from 1995 to 2013. Using linear regression and the ordinary least square method they found, the coefficient of CO₂ emission turned positive and indicated a possible positive relationship between CO₂ emission and life expectancy. Since it is not statistically significant, it suggests that CO₂ emission has not reduced the average number of years of Nigerian life. Yavari and Mehrnoosh (2006) analyzed the effects of socioeconomic factors on life expectancy using multiple regression analysis. This study showed that there is a positive, strong correlation between life expectancy as an independent variable and per capita income, health expenditures, literacy rate and daily calorie intake. Also, it revealed that there is a negative strong correlation between life expectancy and the number of people per doctor in African countries.

3. Methodology of the Study

Data and Variables

Pooled Regression model, Fixed Effects model and Random Effects model use to examine the determinants of life expectancy in selected South Asian five countries (Bangladesh, India, Pakistan, Nepal, Sri-Lanka) for fifteen years (from 2000 to 2014). The data is sourced from a publication of the World Bank database. The period was justifiably selected based on the availability of data in selected South Asian countries.

There are one dependent variable which is Life Expectancy at birth and six independent variables which are economic gross domestic savings, health expenditure, and urban population as a proxy of urbanization, and non economic variables are basic sanitation services, basic drinking water services and carbon emissions.

Table 1. Definitions of Variables

Notation	Meaning
LE	Life expectancy at birth, total(years)
GDP	Gross domestic product per capita (constant 2010US\$)
HE	Current health expenditure (% of GDP)
UB	Urban population (% of total population)
SS	People using at least basic sanitation services (% of population)
DW	People using at least basic drinking water services (% of population)
CO ₂	CO ₂ emissions (metric tons per capita)

Source: Estimated results calculated by the author

Model Specification

Here, life expectancy is considered as a function of economic and non-economic variables and the relationship can be written as follows.

$$LE = f(GDP, HE, UB) \dots\dots\dots (1) \quad \text{and} \quad LE = f(SS, DW, CO_2) \dots\dots\dots (2)$$

The economic variables incorporate gross domestic product, current health expenditure and urban population as a proxy of urbanization. The non-economic variables incorporate basic sanitation services, basic drinking water services and carbon emissions. It is noted here that all variables are logarithmic transformed. The regression model of economic and non- economic variables are shown in two equation,

$$LE_{it} = \beta_0 + \beta_1 GDP_{i,t} + \beta_2 HE_{i,t} + \beta_3 UB_{i,t} + e_{1i,t} \dots\dots(3)$$

$$LE_{it} = \beta_0 + \beta_4 SS_{i,t} + \beta_5 DW_{i,t} + \beta_6 CO_{2,i,t} + e_{2i,t} \quad (4)$$

Where $i=1 \dots 5$ refers to the specific country, t (2000-2014) denotes the time period. The coefficients $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ & β_6 denotes the elasticity of Life Expectancy at Birth, Total (LE) with respect to Gross Domestic Product per capita (GDP), Current Health Expenditure (HE), Urbanization (UB), Basic Sanitation Services (SS), Basic Drinking Water Services (DW), and Carbon Emissions (CO_2) respectively. Here, $e_{1i,t}$ and $e_{2i,t}$ refer to the regressions error term.

The sign of $\beta_1, \beta_2, \beta_3$ coefficient are expected to be positive. If the GDP per capita increases people will expense more to consume goods and services which will enhance life expectancy. A high expenditure on health would suggest a reduction in the number of infant deaths, number of neonatal deaths so that life expectancy would be higher. As urban areas provide better access to medical care, family planning, education and social services, it is expected that growing urbanization will increase life expectancy. The β_4, β_5 coefficients are also expected to be positive. Because improved sanitation services would prevent diarrhea-related diseases as well as increase life expectancy. Easy access to drinking water is an indicator of standard of living that would suggest reducing water-borne disease and help to increase life expectancy. Apart from these coefficients, β_6 is expected to be negative. Increasing CO_2 emission will cause various respiratory diseases which may lower life expectancy.

Empirical Framework

This paper employs a panel data approach to analyze the determinants of life expectancy in selected South Asian countries. The following are the three types of panel analytic models used in this research paper:

1. Pooled Ordinary Least Square
2. Fixed Effects model
3. Random Effects model

The efficient model among three of these is determined by the outcomes of F-test, BPLM test and Hausman specification test. Pesaran CD test is used for testing cross sectional dependence. Modified Wald test is used to see whether heteroskedaticity is exist or not and Woolridge test is used to check the serial correlation in the dataset. Feasible

Generalized Least Square method is used to adjust heteroskedasticity, serial correlation and cross sectional dependence in the model.

4. Findings

4.1 Empirical results: Regression results of equation (3): The results of Pooled OLS, Fixed Effects and Random Effects models are given in appendix (Table-i). F-test, BPLM test and Hausman Specification test are tested to find the appropriate model. F-test compares between Pooled OLS and Fixed Effects model, BPLM test compares between Pooled OLS and Random Effects model and Hausman Specification test compares between Fixed Effects model and Random Effects model. From the appendix (Table ii), F-test indicates that Fixed Effects model is better fit of model than Pooled OLS model with probability 0.000 which rejects null hypothesis (all the group/time specific intercept are zero) and conclude that there is individual fixed effect in the model. Again the p-value (0.000) of BPLM test refers that the null hypothesis (time or individual variance component are zero) is rejected and concludes that there is random effect in the model. That means, the Random Effects model is favored over the Pooled OLS model. The p-value (0.000) of the Hausman Specification test is less than 5%, which implies rejecting null hypothesis (individual effects are uncorrelated with any regressor in the model) and Fixed Effects model is more favored than Random Effects Model.

In the fixed effects model, GDP per capita and urbanization are significant variables to explain life expectancy at 1% level while health expenditure is significant at 10% level and displays a worse sign than expected result.

The probability value of Pesaran CD test, Modified Wald test and Woolridge tests are also given in appendix (Table ii) and the values are 0.5696, 0.000 and 0.000 respectively. The value of Pesaran CD test implies there is no cross-sectional dependence as null hypothesis is accepted which are residuals that are not correlated across entities. The values of Modified Wald test and Woolridge test indicate existence of heteroskedasticity and autocorrelation as p-values are less than 5% and reject the null hypothesis. The null hypothesis is homoscedasticity (constant variance) for Modified Wald Test and no serial correlation for Woolridgetest.

To adjust heteroskedasticity and autocorrelation, the Feasible Generalized Least Square model is used. The result is given as follows:

Table1. Feasible Generalized Least Square Model

Dependent Variable: LifeExpectancy				
Variable	Coefficient	Std.error	z-statistic	Probability
C	3.722519	0.0800059	46.53	0.000
LNGDP	0.0918212	0.0077476	11.85	0.000
LNHE	0.0017391	0.0107759	0.16	0.872
LNUB	-0.048081	0.0157954	-3.04	0.002
Wald chi2 161.000				

Source: Estimated results calculated by the author

Determinants of Life Expectancy

From the p-value of explanatory variables, it is clear that, gross domestic product and urbanization for 5 selected countries are significant at 1% level. On the other hand, health expenditure is an insignificant variable to explain life expectancy.

In this result, gross domestic product has a positive relation with life expectancy which is same as expectation but the negative relation between urbanization and life expectancy which differs from expected result.

We adopt the fixed effects model and later the FGLS estimator to account for heteroskedasticity and autocorrelation for equation (3). From the results shown in the fixed effects model and FGLS model, two conclusions can be drawn. First, all coefficients are significant in the fixed effects model but health expenditure is insignificant in the FGLS model. Second, in the Fixed Effects model, GDP per capita and urbanization have expected positive sign but health expenditure displays incorrect sign. On the other hand, urbanization displays incorrect sign from the expected result but GDP per capita and health expenditure have the correct sign in the FGLS model.

Regression results of equation (4): In the Table-iv of appendix, the probability value of F-test, BPLM test, Hausman Specification test are given. The p-value (0.000) of F-test reveals that null hypothesis is rejected and Fixed Effects model is favored over Pooled OLS model. The p-value (0.000) of BPLM test is less than 5% which indicates rejection of null hypothesis and Random Effects model is appropriate and better fit model than Pooled OLS model. In the Hausman Specification test, p-value (0.4116) is greater than 5% and refers to the null hypothesis that is failed to reject. That means, the Random Effects model is more appropriate than the Fixed Effects Model.

In the Random Effects model, the coefficients of sanitation services, drinking water services and carbon emission are statistically significant at 1% level to explain life expectancy. All the variables are positively related with life expectancy. Sanitation services and drinking water services show correct sign while carbon emission reflects incorrect sign from expected results. (From, appendix Table-iii)

The probability value of Pesaran CD test, Modified Wald test and Woolridge test from appendix (Table-iv) are 0.0464, 0.000 and 0.000 respectively. The p-values of these tests indicate that cross sectional dependence, heteroskedasticity and autocorrelation exist in this model. To take into account these problem, feasible generalized least square model is used in this model too. The result of FGLS model is given as follows:

Table 2. Feasible Generalized Least Squares Model

Dependent Variable: Life Expectancy				
Variable	Coefficient	Std.error	z-statistic	Probability
C	3.270634	0.2846051	11.49	0.000
LNSS	0.071557	0.0051862	13.80	0.000
LNDW	0.1520571	0.0674919	2.25	0.024
LNCO ₂	0.000844	0.0015991	0.53	0.598
Wald chi2	1340.00			

From the p-value of explanatory variables, it is clear that sanitation services is significant at 1% level and drinking water services is significant at 5% level for selected countries. On the other hand, CO₂ is an insignificant variable to explain life expectancy. SS and DW are positively related with life expectancy.

We adopt the Random Effects model for equation (4) and later the FGLS estimation to account for cross-sectional dependence, heteroskedasticity and autocorrelation. From the results shown in the Random Effects model and FGLS model, two main conclusions can be drawn. First, all coefficients are significant in random effects model but CO₂ is not significant in FGLS model. Second, both in the Random Effects and FGLS model, sanitation services and drinking water services have expected positive sign but CO₂ emission displays incorrect sign.

4.2 Discussion of Findings

The study is mainly aimed to empirically investigate the determinants of life expectancy in selected South Asian countries. To achieve the aforementioned objectives, the study applied panel data analysis in the form of Pooled OLS, Fixed Effects model and Random Effects model. In order to select the more appropriate model and better choice for the analysis, F-test, BPLM test, Hausman Specification test were applied as a diagnostic test. The tests imply that the Fixed Effects model is more appropriate and a better choice for equation (3) and Random Effects model is appropriate for equation (4). As heteroskedasticity, auto correlation and cross-sectional dependence exist, the FGLS model is needed to apply. Therefore, the discussion of findings is empirically justifiable based on the result of FGLS estimation. The overall result obtained from the estimation of equation (3) and presented in table-2 are fully not consistent with priori expectation. It revealed that GDP per capita yields a positive impact and is statistically significant at 1 percent level; implying that an increase in GDP per capita leads to an increase in life expectancy. It means that, by implication, GDP is an important factor that improves life expectancy in the selected counties of south Asia. Therefore, GDP determines life expectancy in the selected countries of South Asia. Health expenditure is an insignificant variable to determine life expectancy and urbanization has a negative impact on life expectancy which is contrary to a priori expectation that they improve life expectancy.

Again the result obtained from the estimation of equation (4) and presented in table-3 are consistent with priori expectation. Sanitation services and safe drinking water services have a positive impact and are statistically significant at 1 and 5 percent level respectively; implying that increase in sanitation services and safe drinking water services lead to an increase in life expectancy. It means that, by implication, sanitation services and safe drinking water services are also significant factors to improve life expectancy in the selected south Asian countries. The result further revealed that CO₂ is positively related to life expectancy and an insignificant variable to determine life expectancy in these selected countries.

5. Conclusion and Recommendation

This paper aimed to investigate the determinants of life expectancy in selected South Asian countries. The study covered a period of 15 years from 2000 to 2014. It used panel data analysis in the form of Pooled OLS, Fixed Effects and Random Effects model in carrying out the analysis of the data obtained from five countries of South Asia. The F-test, Breusch-Pagan LM test and Hausman Specification test were applied to select the appropriate and better model for the estimation. The test suggested Fixed Effects Model for equation (3) and Random Effects Model equation (4). Some of the determinants of life expectancy considered are GDP per capita, health expenditure, urbanization, sanitation services, drinking water services and CO₂ emission. All the variables were found significant determinants of life expectancy by Fixed Effects model and Random Effects model in the selected South Asian countries over the period of the study. But the result of the FGLS model slightly differs from previous results. In the FGLS model, GDP per capita, urbanization, sanitation services and drinking water services are found significant. GDP per capita, sanitation services and drinking water services are positively related with life expectancy but there is a negative relationship between urbanization and life expectancy. There are lots of influencing factors which can determine life expectancy. Due to data and time limitations, the researcher included only some of variables such as life expectancy at birth, GDP, current health expenditure, situation of urban population, basic sanitation service system, and carbon emission of five South Asian countries. Based on the findings the following recommendations are drawn: (i.) South Asian countries should increase GDP as GDP positively affects life expectancy. The analysis suggests that life expectancy could be increased in these countries if attention is given to economic growth. (ii.) Sanitation services are an influential variable to explain life expectancy. So countries should focus on sanitation services to increase life expectancy. Public awareness should be raised for better sanitation and hygiene. A greater focus on micro financing and local initiatives may be able to improve sanitation services. Improved sanitation includes connections to public sewers, septic systems, pour-flush and improved latrines but not shared or open pit latrines. (iii.) Safe drinking water positively influenced life expectancy. South Asian countries should ensure safe drinking water for both rural and urban areas. Governmental and non-governmental organizations of these countries should provide incentives and work on improving access to water. Improved water access includes household connections, public standpipes, rainwater collection, boreholes and protected wells. There are lots of influencing factors which can determine by expectancy. Due to data and time limitations, the researcher includes only some of variables such as life expectancy at birth, GDP, current health expenditure, situation of urban population, basic sanitation service system, and carbon emission of five South Asian countries.

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Appendix:

Appendix-i : Regression Results of Equation (3)

Dependent variable: Life Expectancy			
	Pooled OLS	Fixed Effects Model	Random Effects Model
Variables	Coefficients & Probability	Coefficients & Probability	Coefficients & Probability
C	4.102839 (0.000)***	3.120651 (0.000) ***	3.214365 (0.255)
lnGDP	0.0848549 (0.000)***	0.0697404 (0.000) ***	0.0955121 (0.000) ***
lnHE	-0.0837284 (0.000)***	-0.0224969 (0.076) *	0.0157061 (0.000) ***
lnUB	-0.1169172 (0.000)***	0.2008343 (0.000) ***	0.1011628 (0.000) ***
R-squared value	0.7348	0.9207	0.9004

***significant at 1% level, *significant at 10% level

Appendix -ii : Diagnostic Test Results Equation (3)

Method	Probability
F-test	0.0000
BPLM Test	0.0000
Hausman Specification Test	0.0000
Pesaran CD Test	0.5696
Modified Wald Test	0.0000
Woolridge Test	0.0000

Appendix -iii : Regression Results of Equation (4)

Dependent variable: Life Expectancy			
	Pooled OLS	Fixed Effects Model	Random Effects Model
Variables	Coefficients & Probability	Coefficients & Probability	Coefficients & Probability
C	3.367681 (0.000) ***	3.055767 (0.000) ***	3.069305 (0.000) ***
lnSS	0.1167678 (0.000) ***	0.0526116 (0.000) ***	0.0544582 (0.000) ***
lnDW	0.0891238 (0.093) *	0.2198767 (0.001) ***	0.2150184 (0.001) ***
lnCO2	-0.0186792 (0.000) ***	0.0284577 (0.000) ***	0.0266189 (0.000) ***
R-squared	0.7950	0.9140	0.9139

***significant at 1% level, * significant at 10% level.

Appendix -iv : Diagnostic Test Results of Equation (4)

Method	Probability
F-test	0.0000
BPLM Test	0.0000
Hausman Specification Test	0.4116
Pesaran CD Test	0.0464
Modified Wald Test	0.0000
Woolridge Test	0.0000

COVID-19 Induced Emergency and the Responsive Capacity of the Local Government in Bangladesh

Submission: 05-07-2022
Acceptance: 10-11-2022

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Abstract: *The local government institutions in Bangladesh have experienced a new emergency situation during the COVID-19 where the people are in the face of major challenges regarding food, health services, cash money etc. Drawing on this background, the study aims to examine the inherent nature of COVID-19 induced emergency and the emergency responsive capacity of the local government in Bangladesh. To serve the purpose, with an extensive literature review, Narayanganj City Corporation (NCC) of Bangladesh is purposively selected as a case and a pre-structured questionnaire has been developed including a set of indicators of emergency responsive capacity using a 5-point Likert scale. Besides, Key Informants Interview (KII) technique has been applied to supplement the quantitative data. The study reveals that during the COVID-19 a silent emergency situation emerged among the middle class in addition to other crises due to poor networking, communication and information gathering, poor capability at the organizational level, low level of patron-client relationship, dependency on central governmental grants of the local government of Bangladesh. The findings of the study will be of help for policy makers, emergency managers and academicians and will also be a pathway for improved emergency policy and preparedness for local governments of Bangladesh in future.*

Keywords: COVID-19 Induced Emergency, Patron-client relationship, Responsive capacity, Silent emergency

1. Introduction

COVID-19 pandemic has not only created health related emergencies but also created food and economic emergencies of the people worldwide (Shammi, Bodrud-Doza, Islam, & Rahman, 2021; Bodrud-Doza, Shammi, Bahlman, Islam & Rahman, 2020; Haque, 2020). In addition to the health issues, the lower incomes as well as the middle-class people of Bangladesh are tremendously facing the COVID-19 induced emergencies (Paul et al., 2021, Kabir, Islam, & Hossain, 2021, & Bhuiyan, et al., 2021). The COVID-19 is not the first virus to neither strike our cities, nor will it be the last and over the course of history, cities have often been hotbeds of contagion (Florida, Rodríguez & Storper, 2021). The pandemic hit hard the poor in urban areas, caused income losses and disrupted basic service delivery (Relief Web, 2020). Financial, food crisis and depression on one side and tremendous COVID-19 fear especially among the middle class and the poor people on the other have made the situation more vulnerable and complex. The pandemic resulting in the fall down of the world economy leads to removal from jobs in many sectors resulting rapid incensement of unemployment and return of many people from city to rural areas. Half a million expatriate Bangladeshi workers have returned to Bangladesh from 15 major remittance-sending countries (UNCDF, 2020). As a direct consequence of the economic crisis, tens of thousands of people are losing their income and falling into poverty (Paul et al.,

2021) The termination of jobs and the tremendous fear of being affected by COVID-19 and more specifically the suffering of the middle class along with the poor have added new dynamics to this emergency which is different from others in nature that previously experienced. In this actuality, the role of local government to the sudden jobless, poor, middle class and COVID feared people particularly responding to the indifferent nature of this emergency seems vital presently. In this emergency situation the role and duty of local government in different fields are considered vivacious. The local government institutions are considered worldwide now as the prime tools of delivering quick services to the local people. In this situation, local governments play a key role in emergency management by assessing threats to public safety, identifying points of vulnerability, and ensuring that resources can be mobilized for an effective response and swift recovery (Henstra, 2010). The local governments are the suitable institutions that can easily provide governmental services to the doorstep of the local people. Because, the local representatives are well-known about the needs and problems of the local people and they can easily contact their local representatives for any of their needs, problems and services. This constitution of Bangladesh states that the local government is the prime source of people's power, local planning, development and people's participation in the state's decision-making process (Sowdagar, 2020). A relevant study was conducted by Hossain (2021) among the educated young people who are mostly govt. service holders. In the study, it is found that the COVID-19 pandemic creates an environment to change the local government's attitudes in the local governance landscape country-wide. The local body has become more willing to consult with their citizens on public policy settings during the crisis of the COVID-19 pandemic (Hossain, 2021). Due to this new experience of the local government, how this institution can stand with the local people to help them with their resources, planning, service and strategy have been able to seek much attention from the academicians and the policy makers presently. Drawing on this background, the study aims to explore the nature of the emergency situation induced by COVID-19 and to examine the responsive capacity of the local government to this emergency in Bangladesh.

2. COVID 19 induced emergency and the role of local government

Many studies are available in the literature on the challenges, improvement, weaknesses of the emergency response capacity of the governmental institutions and suggested ways and required policies, framework, strategies, techniques, resources, planning and training etc. for pre, during and post covid emergency response and situation. However, very few are found on the nature of COVID19 induced emergency and on how the local government's responsive capacity especially in Bangladesh. Few studies on covid 19 induced emergencies have considered it as new and suggested new approaches to respond effectively. This type of emergency is different that needs a new emergency law and strategic plan to face the emergency (Hossain & Islam 2021). Recognizing indirectly the indifferent nature of COVID-19 induced emergency Atilgan (2020) attempts to identify the ways of crisis management and suggested the formation of new organizations during the COVID-19 outbreak. The local government's incapability to deal and respond to COVID-19 induced emergencies reflected also in the bureaucratization of the local governmental services to the people in Bangladesh. The crisis is new in nature and the local

bodies are incapable of dealing with it in Bangladesh. During this time the government of Bangladesh withdrew politicians from the relief plan and instead tasked 64 most senior civil servants to coordinate relief-distribution (Hoque, 2022). Bhuiyan et al. (2021) identified 8 cases of suicidal death in the covid 19 situation in Bangladesh and all of which are middle class or lower middle-class people of Bangladesh and the cause of all death is economic crisis. The new emergency situation has an impact on local government bodies and the COVID-19 pandemic has created an environment to change the local government's attitudes in the local governance landscape country-wide (Hossain, 2021). He shows that an environment is created where local bodies have been more enthusiastic to consult with the citizens on policy making nevertheless, this study has been conducted only on young and educated government service holders only. For emergency management Ernst, et al. (2007) emphasized on high-quality local emergency management programs to face the tremendous impact of emergencies and disaster's demands. However, he argued that due to scarce resources and many other competing demands local governments often tend to neglect emergency management. Local governments are actually considered as the disaster agents as well as the emergency manager due to its closeness to local people. Mc Entire et al. (2001) suggested a coordination approach among all agents, actors and phases pertaining to disaster vulnerability rather than being limited to technological and natural hazards, be the sole proprietors of disaster and imply alone a response-mentality. Stressing on a framework development for improving responsive capacity Sanjay & Maclean (2003) argued that a framework is required to ensure that modeling and simulation tools can be systematically integrated together to address the overall response that do not attempt to address the overall emergency incident response however, it can help develop and evaluate coordination among plans for multiple aspects of the response that can also significantly improve the response capabilities. Reviewing in detail linking together the capacity assessment theory and emergency management theory respectively Guoqing, Keqin & Zhenqiu (2006) constructed a preliminary, two-dimensional public health emergency response capacity framework consisting of three levels: the systems, organizational, and the individual level. Emergency response capacity depends on the culture of a society also. Cultural values have an impact on the success and failure of emergency responsive arrangement. So, there is no One-Size-Fits-All strategy for response and various responses regarding the same threat depends on the distinctive institutional arrangements and cultural orientation of each country (Yan, Zhang, Wu, Zhu, & Chen, 2020). Herdiana, Mukhlis & Madya (2020) identified law enforcement, a new areas of emergency response capacity, for local government along with human resources, health facilities, budget, coordination for Covid 19 health emergencies which is related to socialize the wearing masks and social distancing movement as an effort to minimize the spread of Covid-19. Kusumasari et al. (2014) suggested the capabilities required for local government in the response stage are assessment, information exchange, and logistical expertise. A prompt, supportive, and empathic collaboration between the government, citizens, and health experts, along with international assistance, can enable the state to minimize the impact of the pandemic (Anwar et al, 2020). Major studies on the impact of covid 19 in Bangladesh covered mostly health care areas, emergency responsive capacity enhancement, declining livelihood status of the poor and the middle class, impact on disabled people etc. are found in the concerned

literature. However, academically the most unexplored area is explaining the indefinite nature of COVID-19 induced emergencies experienced newly in Bangladesh which is different from other emergencies arisen previously and the capability of local government, as a service provider institution, in this emergency of indifferent nature in Bangladesh.

3. Conceptualizing Emergency Response and Emergency Responsive Capacity

Emergency response is a term associated with the disaster situation or disaster management phenomena. While human beings face any disaster, they need instant response from the other people or the state in a situation where people or the individual have no way to save their life and property by their own attempt. Any waste of time in this situation is the loss of their life or the tremendous harm of their life and properties. Therefore, disaster needs an emergency response and time is a crucial factor for any emergency response. In addition, the impact of disaster or the post disaster impacts on human beings also needs emergency response. Mc Entire et al. (2001) argued that emergencies are triggered when hazards, such as floods, train derailments, or industrial accidents, interact with vulnerabilities-physical, social, economic, and environmental conditions-that make a community susceptible to hazards. Wisner & Adams (2002) opined that disaster-management cycles often attract the most attention to resources. Sometimes emergency response is a cyclical process, involving repeated assessment, planning, action and review, to respond appropriately to the needs and capacities as they evolve. It starts with an initial assessment and may be triggered spontaneously by the disaster event, or officials may authorize the mobilization of people and resources. Rapid and effective mobilization is facilitated by proper disaster preparedness. Capacity means the combination of people, institutions and practices that permits countries to reach their development goals. As a key element of capacity building, countries must also address issues related to the enabling environment, in particular: leadership, career structure, critical mass, infrastructure, information access and interfaces between research producers and users. The success of efforts to build capacity in developing countries will ultimately depend on political will and credibility, adequate financing, and a responsive capacity-building plan. Capacity refers not only to skills and knowledge but also to relationships, values and attitudes, and many others (Morgan, 1998). Amit & Schoemaker (1993) refer to capabilities as an organization's capacity to deploy resources, usually in combination and using organizational processes, to affect a desired objective. Capabilities focus on the ability of an organization to learn and evolve, and also on "the antecedent organizational and strategic routines by which leaders alter their resource base acquire and shed resources, integrate them together, and recombine them to generate value-creating strategies (Eisenhardt and Martin, 2000). JICA (2004) innovated some level of responsive capacity like individual, organizational and environmental. The individual level's capacity is the most essential factor of capacity building. It becomes the foundation for organizational capacity that refers to the will and ability of an individual to set objectives and to achieve them using one's own knowledge and skills. Capacity at this level includes knowledge, skills, health, and awareness and so on. Capacity at the individual level can be trained through varied forms such as formal or informal education, on-the-job-training, and independent reading and so on. In the context of organizational development, individual level is also referred to as human resource development. Emergency responsive capacity

refers to the ability that enables an organization to respond successfully to the vulnerable people or community urgently and instantly in the time they need assistance to save their life and property. Mc Entire et al. (2001) constructed concept of vulnerability management termed by him as invulnerable development which is a process, not a condition or a state, whereby decisions and activities are intentionally designed and implemented to take into account and eliminate to the fullest extent possible disaster vulnerabilities. In this sense, invulnerable development is nothing more than vulnerability management. It is thus an attempt to link development activities to vulnerability reduction foment a culture of safety, prevention and preparedness among all individuals, families, groups, businesses, organizations, communities, and nations around the world; and increase the capacities, cooperation, coordination and effectiveness of all public, private and non-profit organizations and agencies involved in or related to disaster management and vulnerability reduction. In this way he linked this process to emergency response. Some scholars linked emergency response capacity to emergency preparedness. Emergency preparedness is the prerequisites of emergency response which enhances the emergency responsive capacity of any organization, community or the state. WHO (1995) defined emergency preparedness as a programme of long-term development activities whose goals are to strengthen the overall capacity and capability of a country to manage efficiently all types of emergencies and bring about a transition from relief through recovery and back to sustained development. Organizations, to achieve the highest capacity of emergency response, have to

Table 1. Emergency Responsive Capacity Requirement for Local Government

Capacities	Sources	Elements of Capacities Local Government
Emergency Preparedness	Wisner & Adams (2002) (Eisenhardt and Martin, 2000) Mc Entire et al. (2001)	Repeated Assessment/ Learn the Lesson and Evolve, Planning
Resources	WHO (1995) Amit & Schoemaker (1993) Labadie (1984) Kusumasari et al. (2010)	Budget, Trained Human Resources, Emergency Equipment
Coordination	Morgan, (1998) Kusumasari et al. (2010) Wisner & Adams (2002)	Leadership Career Structure Infrastructure Information Access Relationship, Value, Attitude
Environment	JICA (2004)	Individual level Organizational Level
Governance/Management	Mc Entire et al. (2001) WHO (1995)	Linking Development Activities to Vulnerability Reduction Emergency Preparedness Management stocks and Relief Supplies Equipment and Identification of Transportation Options
Timely Response		Autonomy

Source: Compiled by the Author

have the programme of emergency preparedness. The goal of the emergency-preparedness programme is to achieve a satisfactory level of readiness to respond to any emergency situation through programmes that strengthen the technical and managerial capacity of governments, organizations, institutions and communities. Such programs are concerned with: national legislation and national policy for disaster management plans and procedures and the coordination of emergency response at international, national and subnational levels. For emergency preparedness WHO (1995) also emphasizes strengthening of institutional and human resources for disaster management and the following things are specifically emphasized: The establishment and management of stocks of relief supplies and equipment and the identification of transportation options. Public education, public awareness and community participation in disaster management. The collection, analysis and dissemination of information related to emergencies and disasters that are likely to occur in the region. Activities in each of these areas will be needed to achieve emergency preparedness. Kusumasari et al. (2010) have seen the capability in managing disaster in the function of institutional resources, human resources, policy for effective implementation, financial, and technical resources and leadership. They also considered the operation of those capabilities as the key success factor of disaster management. Labadie (1984) highlights three problems in local emergency management such as organizational, budget and attitude. He analyzed that the position of the emergency leader of the local government is usually under a line agency like police, fire, or public works. Emergency management must therefore compete with all other line agencies for limited funds. The most obvious attitudinal problem that emergency leaders face is apathy from elected officials, department heads and the general public.

4. Methodology

In this study both qualitative and quantitative methods have been used. The qualitative method helps gaining better insight into the theory and practices of local government's role and responsibility during the pandemic situation. In addition, the perception survey is used to help understand the peoples' perceptions and experiences on emergency required services during the pandemic situation. Narayanganj City Corporation (NCC) of Dhaka Division is purposively selected as research area. To collect quantitative data, people's perception on local government's role and responsibility during the COVID-19 have been surveyed to understand the responsive capacity of the local government in Bangladesh. By stratified random sampling 75 respondents have been selected from the inhabitants of the NCC. Among them 60 are male and 15 are female from selected professions i.e., small businessmen, private service holders and workers. Respondents from the three professions are selected due to the heavy effect of COVID on their health, economic and social life (World Bank, 2020; BIDS, 2020). The survey consists of 5 multiple-choice questions based on a 5-point Likert Scale. The questions were equipped with five issues related to local government services i.e. medical services, food, money, information and networking, communication and identification. Besides, 4 councilors of the local government are selected for key informant interview (KII) by using purposive sampling method. They are interviewed focusing on the variables that include capability, Policy and Planning, Management, Communication, Networking and Information (see Table 1). Data has also been collected from secondary sources. In this regard, an extensive

literature review method is used to review journal articles, newspapers, books, and local governmental official's documents. The survey data are processed and analyzed using SPSS software.

Table 2. List of the Interviewees of KII

SL	Interviewee	Opinion asked
1	Councilor, Ward No 13	Resources, Policy and Planning, Governance, Communication, networking and Information gathering, Preparedness
2	Councilor, Ward No 14	
3	Reserved Councilor, Ward No 7,8,9	
4	Reserved Councilor, Ward No 4,5,6	

Source: The Authors Own

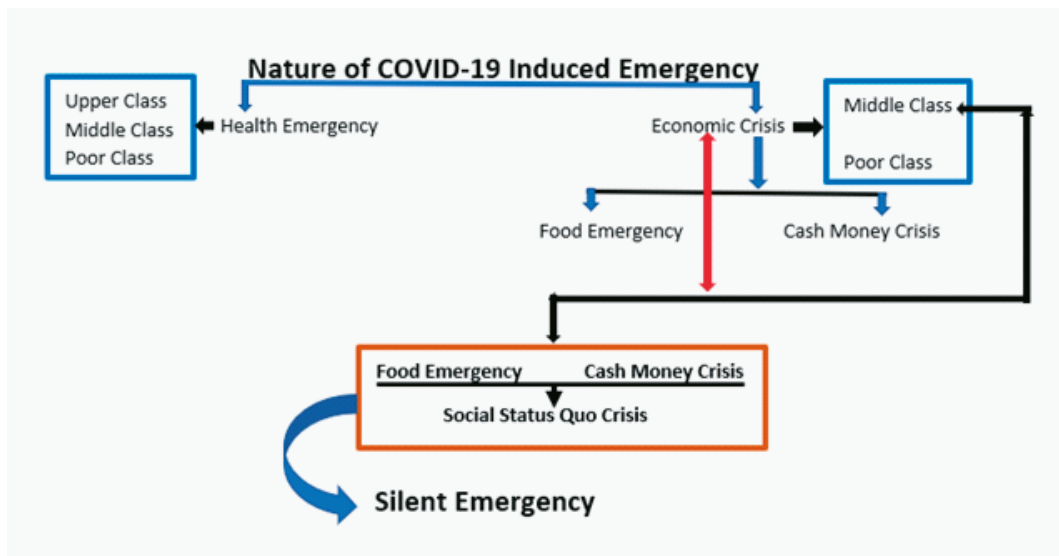
5. The Nature of COVID-19 Induced Emergency

In spite of having numerous impacts of COVID-19 on human life it basically created two types emergency crisis in Bangladesh i.e., treatment hazard/death fear and economic crisis. On the health side it is observed in Bangladesh that initially there was centralization of COVID-19 diagnosis facilities and the Institute of Epidemiology, Disease Control and Research (IEDCR) had only tested 11,223 people, constituting approximately 68 tests per million population (Anwar et al., 2020). Therefore, people were initially unknown about the suitable hospitals for the COVID-19 treatment. In addition, adequate PPE and COVID-19 treatment related instruments are unavailable in the hospitals. For seriously affected patients' oxygen cylinders were not sufficiently available also in the hospitals. The combined lack of PPE and diagnostic testing capacity, fear and anxiety geared up among the mass population, and even many healthcare workers were refused to provide any service to the sufferer (Anwar et al., 2020). Although there was development in the treatment and testing capacity people were not satisfied. In the study 82.2% of the respondents agreed that the medical services required for the COVID-19 were insufficient compared to their needs. Therefore, lack of treatment and death fear on one side and economic crisis on the other have jointly given a clear manifestation of the nature of covid 19 induced emergency. On the economic side, emergency situation arises due to the loss of jobs, shutdown of offices, educational institutions and industries, transportation and communications etc. that lead to the stoppage of the world economic hub. Consequently, people holding private jobs lose their jobs. Some companies reduced the salaries of their employees. Labor class and small businessmen mainly face serious crises of food and cash money that lead to serious difficulties in maintaining their daily life. COVID-19 threatens millions of livelihoods in the country and is a humanitarian crisis which needs supply of food and cash money to the people (Shammi et al., 2021; Saleh, 2022). The impact of the COVID-19 on peoples' livelihood was high to extreme and the lower income people were being more marginalized than before and becoming a member of the hardcore poor due to the pandemic (Paul et al., 2021). A survey report of the Bangladesh Institute of Development Studies (BIDS, 2020) found that 13 percent of people working in the formal sector in

Corona have lost their jobs. Those, whose income is less than Tk 11,000, 58.79 per cent have lost their family income and 32.12 per cent have lost their income. Those whose income is 15-thousand-taka, 23.2 percent of their income have completely stopped and income has decreased by 48.28 percent. Those, who earn more than taka 30,000 lost 39.4 percent and stopped earning 6.48 percent. In this survey the impact of Corona on the lower middle class and middle class is clearly reflected. Besides, the average satisfaction level of the lower and lower-middle-income people on social status and livelihood has declined in Bangladesh after COVID-19 (Kabir et al., 2021). Continuing daily life expenditure has been very difficult for them. This inherent nature of the COVID-19 induced emergencies is different from other pandemic situations experienced before. The sudden economic crisis affects the culture and social status of the individuals and families. It leads to the declining livelihood status of the poor, lower middle class and middle-class people. It is observed in the study that the COVID-19 induced economic crisis of the middle-class has created a lot of social problems for them which is inherently related to the culture of a society. They could not share their food problem to the neighbors and others due to their social status and prestige. They think that sharing the problems of the food shortage with others will harm their social status, dignity, prestige and honor. Therefore, the sufferers are ready to accept any other cruel consequences but to compromise with the social image and prestige. This silent nature of the emergency arises in the society which has not been exposed publicly. Bhuyian (2021) identified 8 suicidal deaths of middle-class people in Bangladesh where 4 were denied any relief or economic help by the local governmental authorities of Bangladesh. It is assumed that the other four did not go to the local governmental authorities for relief. All decided to die rather than any other attempt for a solution to their crisis. In this situation, peoples are not only unwilling to share their crisis to their neighbor but also to the local governmental authorities for any assistance. This is the silent emergency among the middle-class people. In facing this emergency they prefer to preserve and maintain their social status quo rather than any other harm to their life. This is a new dimension of emergency seen during the COVID crisis in Bangladesh. The international news agency DW (Middle Class, 2020) described the situation of the middle-class in terms of income and purchasing power; however, in this pandemic situation, the middle class of Dhaka city is observed leaving the rented house and going to the village. This class can't stand in the line of relief. They can't even talk about their crisis publicly. Holding an intermediate position in the class hierarchy, this class is in a dilemma and could not expose themselves publicly. The ones we see now are defined as the first tires of the middle class; however, economists believe that if this corona situation is prolonged, the next tire will also catch fire. Due to the secondary effect of COVID-19 on the economy in general and loss of jobs, reducing income in particular food crisis is created among the middle class and the lower people. In addition, it is found in the study that due to its silent nature, their emergency situation of food and cash money is not only acceptable and unbelievable but also unrecognized to the local government authorities of Bangladesh. Mr. Farid Ahmed, a middle-class person of Narayanganj city, worked in a hosiery factory for a small salary. His son is mentally sick and has had multiple strokes himself. He faced a corona induced food crisis and called the 333 and asked for food aid. His asking for food aid to the government Upazila Nirbahi Officer was considered as a crime and he was

severely harassed for this crime by the government officer (The Middle Class, 2020). Later the real fact was identified, an investigation committee was formed and punishment of Farid Ahmed was withdrawn. This news report shows us that the crisis of the middle-class people is unbelievable not only to the people but also to the government.

Figure.1 Nature of COVID-19 induced Emergency



The councilors of the city corporation informed that they distribute some relief based on a previous list provided by the NCC. The previous lists are of the poor peoples. Almost all the respondents agreed that they are not identified by the NCC as sufferers. They also additionally informed that they feel shy to go to the local government authorities for any help. The councilors also informed that they helped the people who had come to them for relief who are the poor class. Therefore, in this emergency situation one of the main portions of the sufferers is unidentified whose sufferings in the emergency are hidden and unbelievable to the local government authorities due its silent nature. It is observed that NCC could not prepare, identify or gather any information of the people who are the middle class and the sufferers of the COVID-19 induced emergency. The councilors of the NCC said that the food and money assistance provided by the local governmental authorities were based on previous list done by them which are the list of poor people and who are habituated to go the local governmental authorities. The local government authorities consider this emergency as a traditional one and its new nature, cultural nexus are unknown to them that make the situation more crucial.

6. Emergency Responsive Capacity of NCC to COVID-19

In this study, the emergency responsive capacity of the local government in Bangladesh is one of the fundamental points of investigation. COVID-19 induced Emergency can be handled properly by local government due to its closeness to the local people (Herdiana et al., 2020). Considering this correlation, the local government is the most suitable institution

to provide emergency services to the people during any disaster. In Bangladesh, the local governmental institutions are very popular to the people due to its closeness to the people, its participatory nature, historical background, societal heritage, local representatives' politics and their networking with the local people etc. Among the local bodies the city corporation is the most powerful autonomous local body due to its status, resources and activities in the urban area. With its powerful position and available resources comparable to other local bodies it is a general perception that the city corporation is more capable and can provide emergency response to its people during the disaster situation. Very few pandemic is seen, except COVID-19, in the world history that stopped the world economic hub which has created tremendous economic challenges to the maintenance of daily life of people in the whole world. In addition to the traditional challenges of the pandemic like health security, water and food crisis, availability of medicine, COVID-19 has brought a new challenge which is considered in this study as a silent emergency situation where some people are unwilling to share their crisis of food and money to others or to any local governmental authorities and therefore their emergency crisis is unknown to all. Maintaining their social status quo is valuable to them rather than any harm to their life. Generally local governments of Bangladesh are habituated to deliver their services to poor class who come to them for any service however, inexperienced about those who never want to go to them in spite of having an emergency crisis in the COVID-19 situation. The Disaster Management Act of Bangladesh (GOB, 2012) is enacted with a view to creating the legislative tool under which disaster risk and emergency management will be undertaken and the legal basis in which activities and actions will be managed. It has also created mandatory obligations and responsibilities on ministries, committees and appointments. The objectives of the Act are: a) To help communities to mitigate the potential adverse effects of hazard events, prepare for managing the effects of a disaster event, effectively respond to and recover from a disaster or an emergency situation, and adapt to adverse effects of climate change; b) to provide for effective disaster management for Bangladesh; c) to establish an institutional framework for disaster management; and d) to establish risk reduction as a core element of disaster management. Therefore, the people of the concerned urban areas are generally and legally expecting these types of services due to its closeness to the people.

Considering the theories of local government, emergency response theory, the Local Government Act, the Disaster Management Act of Bangladesh as well as the nature of activities of the city corporation five categories i.e., providing medical services, food, cash money, information gathering, networking, and identifying people for emergency assistance during COVID-19 pandemic are selected and according to these categories five question were asked to the people to understand the emergency responsive capacity of the NCC. In addition, in the same consideration four Councilors of the NCC are interviewed on food and finance providing, policy and planning, information gathering and networking, human resource and training etc. Both positive and negative questions are asked to the respondents and they answer very consciously and frequently. Analyzing those data the following things on responsive capacity of the NCC are found in the study.

6.1 Resource scarcity, dependency and timely response: In answering to the question of providing inadequate medical services to the people by the city corporation a total 82.22% (strongly agreed + agreed) of the respondents opined that they did not get their required medical services from the NCC. In the same matter the councilor 3 (Table 1) opined that they have collected some corona samples and sent them to the hospitals and 10-12 doctors were given online consultation to the people. Another councilor, interviewer 4, said that the corporation, to some extent, helps affected people by sending them to hospitals and advice for making them conscious for COVID-19. No more services on health care during the COVID-19 are seen under the arrangement of City Corporation except these. The public health infrastructure of the NCC is too poor. The corporation has only a health department with insufficient facilities and is unable to provide required treatment for COVID infected people. The KII data and the data collected from the target group says that the policy, planning, infrastructure, resources, and human resources are all insufficient in responding to COVID-19 related treatments. In health-related services the NCC is fully dependent on the governmental grant. As an autonomous body the corporation is too weak to practice its power of autonomy. The food crisis, due to the lockdown for COVID-19, is created among the poor and middle-class people. The poor people are directly seeking the help of local government, NGOs and individuals however, the middle class couldn't because of losing their social status and dignity. It is identified in the study as a silent emergency crisis that needs to be responded to differently. Almost all the councilors are in the opinion that they have not identified the sufferer rather they helped those who has come to them and they followed the previous list to help people. A Councilor expressed that there was not enough time to prepare a list of the sufferers and they followed the previous list for this reason. Mentioned that previous list is the list of the poor people not the newly added sufferers who are the middle class. Therefore, communication, networking, and collecting information of the middle-class people, who never want to share their food and money crisis to others, are necessary to respond the crisis characterized by its silent nature. Among the respondents 85.4% are in the opinion that the food provided by the corporation is insufficient. In this regard a councilor said that the government has provided 10 kg of rice, 2 kg of potatoes and 1 kg of pulses as relief to some families living in the City through the City Corporation. This relief has been given 3 times during the crisis. This food assistance is insufficient compared to the needs of the people. The interviewer 3 said that he got some rice and potato from the government and these were distributed in some areas and additionally he distributed some food privately. The interviewer 4, a councilor also opined that he officially received some rice, pulses, potatoes and children's food which is delivered in various ways by his own initiative however, these are insufficient than the needs of the people. Due to loss of jobs, reduction of salary and the workers who live their daily life with their daily work are facing tremendous financial crises in addition to food. They couldn't continue their daily family expenditure. In this actuality, the government has provided some financial help to the citizens through the NCC. When the respondents were asked about the insufficiency of financial help from the government through the city corporation 94% of them agreed that money provided to them is insufficient. Besides, the four councilors also opined the

insufficiency of the money provided to the sufferers and the money is provided by the government however, the NCC's capability to provide financial assistance to the people during the emergency is not found. The study shows that the corporation has to depend on the governmental grants of food and finance. This dependency on governmental grants is contradictory to the timely response to the people during the emergency crisis. Timely response is highly dependent on the financial autonomy (Table 1). The councilors are also in the same opinion that due to City Corporation's dependency on governmental grant timely response during the emergency is impossible. In addition to the limited resources, lack of financial autonomy of the corporations is found in the study as a prime hurdle on the way of quick response to emergency situation.

6.2 Low level of coordination and patron-client relationship: Considering the constitutional provision of local government of Bangladesh, local government act and the theories of local governance the local governmental authorities are the patron and the local peoples are the clients. Thereby the patron client relationships are explained in the act, rules and guidelines. In the study information gathering, networking and identifying the people who are suffering are considered most vital for effective patron-client relationship. In the pandemic situation especially the middle-class people who never want to disclose their sufferings and scarcity of food need to be identified due to their unwillingness to share their crisis. This silence nature of the crisis is unidentified by the local government authorities. The respondents are asked about the identification of the sufferers for emergency assistance. They were asked positively that the NCC has been able to reach the citizens living in the area under its jurisdiction and identify the people who are suffering and need relief. In this positive question 94.7% (strongly disagreed + disagreed) of the respondents disagreed, 5.3% were neutral however, significantly no respondents agreed with this positive opinion (Table 3). The respondents were also asked positively that the City Corporation has been able to communicate with the citizens and listen to their problems, gather their information and provide appropriate assistance accordingly during the pandemic time. Responding to this statement 96% (disagreed 40% + strongly disagreed 56%) of them disagreed with this and significantly no agreement is found with this opinion (Table 4). In the interview the four councilors opined almost the same that they have collected some information individually or by their relatives of the sufferers and if somebody wanted help then they had responded to him. Here, it is identified that for information gathering and networking there is no institutional arrangement of collecting information of the sufferers who need emergency assistance that shows a poor level of patron client relationships. No respondents opined that they are satisfied with the individual attempt of collecting information of the sufferers and they like institutional attempt and arrangement. Nevertheless, this individual attempt of the councilors can be appreciable in this situation. As JICA (2004) opined this individual level's emergency management is very vital and termed it as the foundation for organizational capacity that refers to the will and ability of an individual to set objectives and to achieve them using one's own knowledge and skill that can be transferred into organization aptitude. The councilors have no training for emergency

management and response and they agreed that they have lack of trained human resources, planning etc. Therefore, this individual eagerness of the councilors is the positive and suitable tool for making them resources of emergency response and preparedness if training is given to them and policy is taken to transform the individual skill and strength into organizations one.

Table 3. Identifying People for Emergency Assistance

Opinion	Frequency	Percent (%)
Neutral	4	5.3
Disagree	29	38.7
Strongly disagree	42	56.0
Total	75	100.0

Source: The Author's Own

Note: The City Corporation has been able to reach the citizens living in the area under its jurisdiction by identifying the people who needed relief.

JAICA (2004) also observed that organizational capability can be achieved if the individual capabilities are utilized through training, providing the material support for emergencies. When the councilors, as they opined, individually took an attempt to provide assistance like food and other things to the sufferers of COVID 19 they were not getting transportation support from the city corporation.

Table 4. Information, Communication and Networking

Opinion	Frequency	Percent (%)
Neutral	3	4.0
Disagree	30	40.0
Strongly disagree	42	56.0
Total	75	100.0

Source: The Author's Own

Note: The City Corporation has been able to communicate with the citizens and listen to their problems and provide any information and appropriate assistance accordingly in the COVID-19 induced emergency.

6.3 Poor capability at the level of environment creation: JAICA (2004) explained emergency response capacity at the environmental level which refers to the environment and conditions necessary for demonstrating capacity at the individual and organizational levels that include systems, frameworks, policies and strategies, implementation mechanism, informal institutions (customs, cultures, norms, etc.), social capital, social infrastructure and capacities beyond an individual organization and organizations under environment. This is also the concept of invulnerable development, a process of

vulnerability management and an attempt of linking development activities to vulnerability reduction, foment a culture of safety, prevention and preparedness among all individuals, families, groups, businesses, organizations, communities, and nations around the world; and increase the capacities, cooperation, coordination and effectiveness of all public, private and non-profit organizations and agencies involved in or related to disaster management and vulnerability reduction (McEntire, Johnston, & David, 2001). JAICA (2004) and McEntire et al. (2001) are all in the opinion that the environment has to be created to address vulnerability that includes individual and organizational levels capability. It is found in the study that the individual has the enthusiasm to address the vulnerability however, they need the environment of local government's cooperation. The councilors claim that they did not get any vehicles from the NCC while serving the emergency food delivery to the affected people with their own individual attempt. They also said that they have individually communicated with some people and also helped those who have come to them for help. The study shows the individual's enthusiasm but organizational unwillingness and ignorance to respond the emergency situation induced by COVID 19 in Bangladesh. In addition, all councilors are of the same opinion that trained human resources, policy, logistic support, special allocation, and emergency team are required for the organization's emergency response capacity building. In emergency response, providing timely services to the sufferers is the most significant.

7. Conclusions and Policy Implications

With an extensive literature review of the published materials, pre structured questionnaire survey from the respondents and open-ended interview with the KII the article reveals that besides the traditional emergency crisis like food, health care and economic crisis during the COVID-19 a silent emergency situation also emerged among the middle class where they could not expose the scarcity of food and cash money crisis to others and never want to disclose their sufferings and the local government authorities have no suitable policy, planning and strategy to address the silent emergency of the middle class. The paper revealed that weak networking and communication, poor coordination and patron-client relationship and dependency on central government grant of the local government institutions of Bangladesh are the prime hurdle on the way of responding timely to the suffers of the emergency. The present study argues that information gathering, networking and community engagement to assist the people facing silent emergency are the suitable strategy to address this situation. For emergency responses this situation needs to be identified by the local government due to the middle class's unwillingness to share their crisis to anybody. Information gathering of the sufferer, networking and identifying the people who are suffering are mostly necessary to address the situation. In addition, individual attempts of local governmental officials to respond to sufferers in the emergency is seen however organizational unwillingness and incapability to cope up the individual's skill and enthusiasm is also seen in reverse in the urban local governance in Bangladesh. The study suggests that the individual's skills and enthusiasm might be received, coordinated and added with the organization and the combination of the two can create an environment of emergency response.

Considering, the nature of COVID-19 induced emergency, the study identified some

requirements for preparation i.e. timeliness, resources capability, efficient and trained manpower, networking connectedness and closeness to people, community engagement for information gathering, emergency response policy and planning. The study also suggests that the emergency preparedness policy and planning is essentially required at all levels to the concerned communities, organizations as well as national and international levels so that the emergency response can be carried out with clear knowledge, objectives and suitable technical know-how. The study suggests further study on impacts of the silent emergency situation imposed by COVID 19 and the proper policy implications to address the situation in future.

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Transgender People in Bangladesh: Life Challenges, Competence and Scope of Inclusion in Development

Submission: 05-05-2019
Acceptance: 10-11-2022

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Abstract: *As a sexual minority group, transgender people in Bangladesh face different challenges that push them into deep marginalization and turn away from development. The present study has intended to explore the life challenges, competence, arena of interest of transgender people, along with to search out the expectations and recommendations towards their inclusion in development. For this, using sample survey method, this study has been carried on the basis of primary data. Analyzing data collected through interview from transgender people it is depicted that isolation and deprivation from family and society impels them towards sub-standard life and having no static income source forces them to earn in unethical ways. But majority of them possess minimum education; some have training on different trades and a few of them have the access to special services. Nevertheless, education, training, and service coverage are inadequate to meet their needs and aspirations. So, addressing their challenges and inclusion in development, it is essential to prioritize their standard educational, interest based pragmatic skills and to expand the development programs as well as affirmative social outlook towards their 'otherness'.*

Keywords: Competences, Expectations, Inclusion, Life challenges, Transgender people

1. Introduction

'Sexual minority groups- social exclusion- leave behind of development'- these consequential events are common and inevitable phenomena in all over the world. As a sexual minority group or socially excluded group, a few portion of people in Bangladesh is out of civil rights, security or legal services, even deprived from family or social attachment. They are familiar as 'Transgender' or 'Hijra' or '3rd gender' in Bangladesh. The entire development of a country indicates the inclusion of all classes of community and its ethical value is "leave no one behind". As a principle of SDGs it has already been adopted by the Government of Bangladesh for achieving the agendas for SDGs. So it is the time to agree upon with their rights, recognition as distinct gender identity, talents exploration as well as inclusion in national development.

A study of Lancet (2016) stated that globally transgender people along with other sexual minorities share 3 to 5 per cent (an estimated 25 million) of all the population (Winter et al., 2016). In Bangladesh the number of transgender is 12,629 as per the preliminary report of the Population and Housing Census 2022 (The Business Standard, 2022). But another statistics shows that the estimated number of them ranges from 10 thousand to 5 lakh (MoWCA, 2019). However, the bill of recognition of transgender people as separate gender or 3rd gender was passed in November, 2013 (GoB, 2015). But regrettably, they did not get facilities in line with this recognition due to lack of its proper execution. In 2008, they have got the right to vote for the first time as women or man because of not having third option. Even though they are now enlisted in voter list under the identity of third gender, only 441

of them were incorporated in the last voter list of the National Election Commission in 2021 (United News of Bangladesh, 2021). Moreover, 'authentic Hijras to be identified through medical check-ups' required by the Ministry of Health and Family Welfare (Titir, 2019) is another cruel and humiliating provision for them which is not entitled in international law.

From the early stage transgender people are bound to detach from their family, relatives and society. Therewith, they are oppressed, despised, disinherited. Besides, they experience hurdles to get into health care and health defining resources; i.e., education, occupation and accommodation (Blondeel et al., 2016). Sometimes, they are enforced to agree upon unsafe sexual intercourse with clients, local influential and police at no charge (Khan et al., 2009). As a total consequence, different issues related to mental health (i.e., depression, mood and anxiety disorders, and suicidal ideation) are to be met by them (WHO, 2016). So, they impair their self-esteem, worth, and responsibility that gradually make them socially excluded.

In this backdrop, it is needed to involve the transgender people in development initiatives to minimize their marginalization. So, in collaboration with non-governmental and private organizations, the Government has already taken the skill building initiative for transgender who prefer either small entrepreneurship or small cooperative societies as the means of their livelihoods (GoB, 2015). Since 2012-13 budgetary year the government has been implementing the living standard development program for the transgender community (Table 1.1). Besides, the National Human Rights Commission of Bangladesh has been working on improving their health and rights since 2000. Without government services, icddr,b has provided HIV prevention services for 4,062 transgender people through 53 service delivery centers at 36 districts across the country (ASP, 2018). Moreover, Bandhu Social Welfare Society, Badhan Hijra Sangha, Brihonnola and some other NGOs work to establish their rights and deliver services. But the service coverage or types of services are not adequate to fulfil their needs and overcome their life challenges.

Table 1.1 Distribution of services by the number of beneficiaries in different budgetary years (2012-2023)

Different budgetary years	Number of beneficiaries under different services				
	Senior/special grant	4 levels of educational scholarship	Socio-economic training	Post-training grant	Total beneficiaries
2012-13	-	135	350	-	485
2013-14	1071	762	950	120	2903
2014-15	1300	789	850	340	3279
2015-16	2340	1329	1500	1500	6669
2016-17	2340	1330	1650	1650	6970
2017-18	2500	1350	1900	1900	7650

2018-19	2500	1247	1900	1900	7547
2019-20	2600	1225	1920	-	5745
2020-21	2600	1225	1920	-	5745
2021-22	2600	1225	1920	-	5745
2022-23	2600	1225	1920 (Tentative)	-	5745

Source: Department of Social Services, Ministry of Social Welfare, 2022

Review of the transgender literature shows that most of the study regarding transgender people focused on transgender health and life challenges; i.e., surgery, hormones, endocrinology, diseases, HIV care, mental health, reproduction, sexuality, linguistics, voice, pediatrics, aging, law, incarceration, education, bioethics, nursing etc. (Wanta & Unger, 2017). Besides, neurocognitive perspectives, family relationship, discrimination were also revealed in some studies. But, no distinct research work has so far been conducted on the exploration of competence or interest of transgender people and mainstreaming them into development and society. In this circumstance, it is needed to conduct a comprehensive study which can reveal their life challenges and needs; can explore their educational attainments, skills or arena of interest; therewith, can examine their inclusion into development measures, and can analyze how to involve them into further development activities for their betterment. Hopefully, this study can contribute to fulfil that needs to some extent. Besides, it can help to realize their torpid, hurtful phenomena and grow mindset to confess their distinctness.

2. Objectives of the Study

The premier aim of this study is to explore the gap in knowledge about the competence, arena of interests of transgender people and the way of inclusion in development as well as to contribute in the relevant policies that can address their challenges. More specifically, this study is focused on the following objectives:

- a. to know the life and life challenges of transgender people;
- b. to explore their competence and arena of interest;
- c. to search out their expectation and recommendation towards their inclusion in development.

3. Theoretical and Conceptual Framework

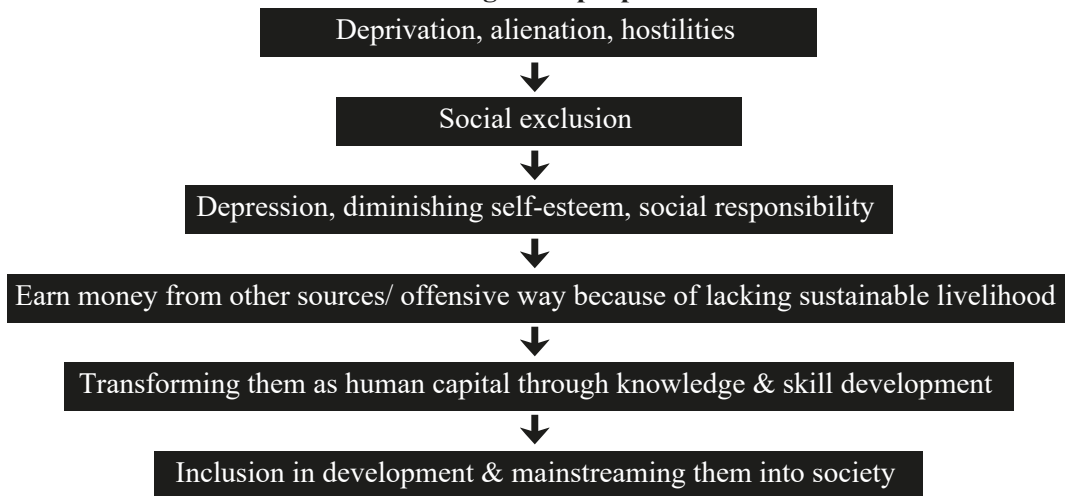
It is common to transgender people that they are socially excluded due to lack of their family and social attachment. In addition to less substantial means, theoretically social exclusion comprises the inability of effective engagement in socio-economic, cultural, and political life and in some categorizations, alienation from the typical society (Duffy, 1995). In another word, it happens when some interrelated problems are met by people or areas; i.e., joblessness, disparity, poor competence, inadequate income, poor housing, high criminality, and family disorganization (SEU, 2004).

Because of social exclusion transgender people do not claim any rights and facilities from anywhere. Moreover, they have no source of sustainable livelihood. So, they are to be

impelled to earn money from others coercively for their livelihoods. Sometimes, coerciveness derives them towards crime. Here, sustainable livelihood can make their life smooth and reclaim their self-esteem. Whereas, in theory, the sustainable livelihoods frameworks recommend a methodical, extensive, cross-sectoral, and actor-oriented strategy for understanding the lives of underprivileged and marginalized people and link them to macro level policy for diminishing their poverty (Bennett, 2010). So, ensuring sustainable livelihood it is necessary to transform them as human capital through knowledge and skill development. In human capital theory, it is thought that education "helps develop skills of work, that is, improves the capacity of the worker to be productive" (Sweetland, 1996: 354).

When transgender people are treated as human capital, their social inclusion will be facile. It also helps to mainstreaming them into development. As social inclusion improves the capability, amenity and dignity of disadvantaged individuals and groups on the basis of their identity on which they take part in society (The World Bank, n.d.). However, social inclusion, mainstreaming into development as well as empowering the transgender people depends on the attachment and collaboration of common people with them. Here, transgender theory helps to realize, work with, and empower transgender people and create alliance between them and other socially tormented group (Nagoshi & Brzuzy, 2010).

Figure 1. Conceptual view from exclusion to inclusion process in development of transgender people



Source: Developed by the author

Definitions of key concepts

Transgender people

Due to variation of laws and cultural traditions transgender people are termed or defined differently. Conceptually, it is stated that- "transgender is an umbrella term used to describe the full range of people whose gender identity and/or gender role do not conform to what is typically associated with their sex assigned at birth" (APA, 2015:863). In present study, the people in the ages of 10-60 years, who are identified as distinct gender

by themselves and their family and living in transgender community or alone or different way in given areas are treated as transgender people.

Life challenges

The literary meaning of challenge is "something that needs great mental or physical effort in order to be done successfully and therefore tests a person's ability" (Cambridge University Press, n.d.). And life challenges are those problems and issues that interrupt to keep up the life standard and to reach the life goals of human beings (Spacey, 2022). In this study, life challenges are such issues that are derived from deprivation, alienation, stigma, discrimination, violence, mistreatment, hostilities towards transgender people that make their life critical and gradually push them into deep marginalization.

Competence

Generally, competence means the ability to do something successfully or efficiency. In present study, competence is stated as the amalgamation of those capabilities which are constituted through education, training-based skills and thinking towards own aspirations that help the transgender people to enrich their own entity.

Inclusion

Inclusion indicates "the idea that everyone should be able to use the same facilities, take part in the same activities, and enjoy the same experiences, including people who have a disability or other disadvantage" (Cambridge University Press, n.d.). In this study, inclusion refers to the involvement of transgender people in the development programs undertaken by the Government of Bangladesh and non-governmental organizations as well as accessibility to get the facilities. In broad scene, it indicates the participation of transgender people in all spheres of development through competence that increase their life standard and social acceptance.

4. Methods and Data

The data that is used in present study, is collected from the study titled "Skilling and promoting the transgender people in Bangladesh" which is conducted all over the country. Here, non-experimental research design is followed and as research approach, quantitative approach is used that is employed survey method

A total of 120 transgender people is selected as sample on the basis of the two stages random sampling technique and purposive sampling. At first, this study is concentrated at eight thanas randomly in four divisions; i.e., Wari & Shahabag in Dhaka, Dinajpur kotwali & Rangpur kotwali in Rangpur, Laksham & Chandpur kotwali in Chattogram, Kaligong & Kothchanpur in Khulna division and 15 transgender people in each thana are selected purposively as respondent ($8 \times 15 = 120$). To collect necessary data from them, different methods which are relevant to the nature of the present study (i.e., face to face interview and observation) are used. And as instrument of data collection, interview schedule is used that is comprised of both structured, semi-structured, and unstructured questions. As the nature of data is quantitative, different statistical techniques are employed to analyse data; i.e., descriptive and explanatory analyses. In terms of examining variable(s), univariate and bivariate analyses are used.

Different ethical considerations, such as explaining the purpose of the research, respondents' consent, consent in recording the interview, assurance of confidentiality, allowed to withdraw at any stage, and the like are followed in this study.

5. Results and Discussion

5.1 Life and life challenges of transgender people

Age, age of realization or identification as apart from others:

The transgender people who are entitled in this study are mostly young and their mean age is 27.73 years. More than two-thirds (68.33%) of them belong to 10-30 years. Among all the respondents, 19.17 per cent and 7.4 per cent belong to the ages of 30-40 years and 40-50 years, respectively. A few of them (5%) are over fifty years.

From the middle childhood to early adolescence stage, most of the transgender people (82.5%) had to face the inexorable and ultimate truth. And that was- they were apart from others. Among them 40 per cent and 42.5 per cent realized it within 8-10 years and 11-13 years, respectively. Moreover, a few of them (17.5%) realized this corporeity at early childhood stage and that was within 5-7 years (Table 5.1). The statement of Heckman & Schultz (2007) can be mentioned here; that is- "early learning begets later learning and early success breeds later success, just as early failure breeds later failure". It indicates that childhood stage is very pivotal for growth and development. But within 5-10 years more than half of transgender people (57.5%) realized that they were not like others. This realization hampered their regular development, created extreme depression, undermined their personality and social responsibility.

More than half of the family members of transgender people (56.67%) were able to detect their sexual distinctiveness within two years. More than one-third of their family (40%) identified them within 3-8 years. Only a few of them (3.34%) were identified comparatively late and that was within 9-11 years (Table 5.1). Hence, majority of their family members (84.17%) identified their sexual distinctiveness within highest five years that isolated them from family bondage.

Table 5.1 Age of realization or identification as apart from others

Realization or identification as apart from others	Age (years)	Percentage (N=120)
Realized by transgender people	5-7	17.5
	8-10	40.0
	11-13	42.5
	Total	100.0
Identified by the family members of transgender people	0-2	56.67
	3-5	27.5
	6-8	12.5
	9-11	3.34
	Total	100.0

Source: Field study, 2018

Living condition, livelihood, income, and income sufficiency of transgender people:

By analyzing the types of living, it is illustrated that majority of the transgender people (85.83%) live in transgender community and the rest of them (14.17%) live alone or separately or in different way. Notable that no one has the opportunity to live with their family. As they are torn apart from family bondage in early stage, they are to be bound to live with their distinct community.

Without belonging to family, not having the right to patrimony, financial insolvency as well as insolvency of general people impelled them to live in tiny houses. By analyzing the housing condition, it is seen that about half of them (45%) live in teen shaded houses. And the rest of them live in brick and semi brick made houses and this rate is in both cases 27.5 per cent.

In terms of source of livelihood, it is observed that community income is the key income source of them and more than three-fourth of them (75.83%) depend on it. As community income source, they mentioned various traditional ways; i.e., collecting money from shops or the street, singing & dancing for a new born baby or during the wedding ceremony. Besides, who earn individually, the highest number of them (19.17%) collect cash or product individually from mass people. Moreover, 11.67 per cent of them earn from governmental & non-governmental organizations as allowance. And a small but fortunate part of them (2.5%) get the financial support from their family and a few of them (5%) earn through otherwise (Table 5.2). But regrettable that only 4.17 per cent, who earn individually, enjoy their full income; whither 88.33 per cent enjoy half of their total income because of binding to share their income with the transgender community leaders or other local influential persons where they live.

Table 5.2 Sources of livelihood of transgender people

Income earner	Sources of livelihood	Percentage
Individual/ self	Cash or product collection individually from mass people	19.17
	Family support	2.5
	Financial support from governmental & non-governmental organizations	11.67
	Others	5.0
Community/ group	Community income (collecting money from shops or the street, singing & dancing for a new born baby or during the wedding ceremony)	75.83

Source: Field study, 2018
Note: Multiple responses Table

The range of income of transgender people is not so sufficient to maintain minimum standard of living that is reflected through their opinion. Their average income is BDT 14,659. Majority of them (90.83%) earn highest BDT 20,000. Among them 39.16 per cent, 32.5 per cent and 19.17 per cent earn BDT 5,000-10,000, BDT 10,000-15,000 and BDT

15,000-20,000, respectively. About half of total respondents (47.5%) think their income is not sufficient at all to maintain minimum standard of living. The highest number of their income range is BDT 5,000- 15,000 and the second highest is BDT 15,000-20,000. This rate is 32.5 per cent and 14.17 per cent of total respondents, respectively. Besides, half of them (50.0%) opine that they fulfill their partial needs as well as maintain minimum standards of living partially through their income. And the highest number of them (39.16% of total respondents) are in the income range of BDT 5,000-15,000. Whither a little portion of total respondents (2.5%) think that their income is sufficient for maintaining minimum living standard. Here, it is notable that their income is more than BDT 20,000 (Table 5.3).

Table 5.3 Distribution of income by the opinion of transgender people about their income sufficiency to maintain minimum standard of living

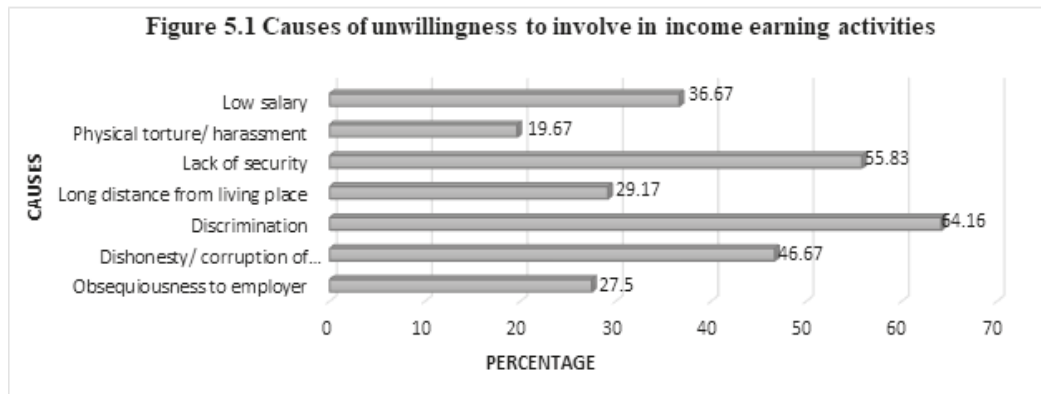
Income (per month in BDT)	Income sufficiency to maintain minimum standard of living			Total (%) (N=120)
	Yes (%)	Partial (%)	No (%)	
5,000-10,000	0	18.33	20.83	39.16
10,000-15,000	0	20.83	11.67	32.5
15,000-20,000	0	5.0	14.17	19.17
20,000-25,000	1.67	4.17	.83	6.67
25,000-30,000	.83	1.67	0	2.5
Total	2.5	50.0	47.5	100.00

Source: Field study, 2018

Causes of unwillingness to involve in income earning activities:

The common tendency of transgender people is not to involve in any income earning activities, yet the sources of income are not so immense as well as smooth and the income range is not so sufficient. Even some evidences claim that some of transgender people who have got job through government or non-government initiatives, have backed to their traditional life after passing a few days. So, it is necessary to find out the real cause(s) behind the reluctance to involve in any income earning activities.

In answering this question about two-thirds (64.16%) of them mentioned that they had to face diverse discrimination in work place and more than half (55.83%) of them felt insecure to involve in work. Besides, dishonesty or corrupted attitude of employer sometimes dispirited them to engage any income earning activity and this rate was 46.67 per cent. Low salary structure was another disinterestedness to involve in work that was raised by more than one-third (36.67%) of them. Besides, long distance of workplace, physical harassment, obsequiousness to employer were also mentioned by 29.17, 19.67 and 27.50 per cent of them, respectively (Figure 5.1).



Source: Field study, 2018

Needs toward and deprivation from family, society and state:

There exists a dichotomous direction between the needs and deprivation of transgender people. About two-thirds transgender people (64.17%) desire family recognition and acceptance completely but 58.33 per cent were totally deprived and only 6.67 per cent got it. Majority of them (88.33%) want mental and emotional assistance from their family but only 5.83 per cent got this support. 71.66 per cent of them expect to the right of patrimony but regrettably, most of them (90.0%) were out of patrimony. About two-thirds of them (64.17%) feel the necessity of financial support and maintenance from the family but most of them (83.33%) did not get it (see Table 5.4).

Like other human beings almost all of transgender people (99.17%) also need social attachment and acceptance but only 4.17 per cent were accepted by society. Most of them (93.34%) want to participate social events but only 13.33 per cent could participate either force or call for. Though all people are equally treated in constitution and majority of transgender people (95.84%) feel equal social justice to them, more than half of them (52.5%) were completely deprived from it (see Table 5.4).

Though all citizens of Bangladesh have equal rights to the state and government, only 20.50 per cent of transgender people had the access in civil rights whereas majority of them (81.67%) expect these rights. Besides, all of them awfully want to get health services but more than one-third of them (39.17%) had no access and about half of them (46.67%) had partial access to it. In access to educational facilities, majority of them (81.67%) desire to get it but more than half of them (55%) were completely deprived. However, majority of them (95%) want to get coverage in government allowance, only 27.5 per cent were enlisted in this coverage (see Table 5.4).

Thus, in spite of having needs towards family, society even state, most of the transgender people deprived completely and partially. Ultimately, this situation turned them into marginalized and socially excluded. Another study shows that their deprivation, distancing and antagonism since early childhood are so profound and excessive that, sometimes they exclude themselves seeking no other social space (Ahmed, Yasin, & Umair, 2014).

Table 5.4 Needs toward and deprivation from family, society and state

Agents	Issues	Needs				Deprivations			
		Complete (%)	Partial (%)	No (%)	Total (N=120)	Complete (%)	Partial (%)	No (%)	Total (N= 120)
Needs towards family and deprivation from family	Family recognition & acceptance	64.17	22.50	13.33	100.00	58.33	35.00	6.67	100.00
	Mental & emotional assistance	57.50	30.83	11.67	100.00	55.83	38.33	5.83	100.00
	Right to patrimony	50.83	20.83	28.33	100.00	66.67	23.33	10.00	100.00
	Financial support & maintenance	46.67	17.50	35.83	100.00	57.50	25.83	16.70	100.00
Social needs & deprivation	Social acceptance	74.17	25.00	.83	100.00	47.50	48.33	4.17	100.00
	Participation in social events	69.17	24.17	6.77	100.00	46.67	40.00	13.33	100.00
	Right to equal social justice	71.67	24.17	4.17	100.00	52.50	38.33	9.17	100.00
Needs towards state & deprivation from state	Access in civil rights	67.50	14.17	18.33	100.00	21.67	58.33	20.50	100.00
	Access to health facilities	69.17	30.83	0.0	100.00	39.17	46.67	14.17	100.00
	Access to educational facilities	81.67	10.00	8.83	100.00	55.00	30.83	14.17	100.00
	Getting any allowance/ special services	78.33	16.67	5.00	100.00	72.5	0.00	27.5	100.00

Source: Field study, 2018

5.2 Competence and arena of interest of transgender people

Educational attainment of transgender people:

It is unambiguous that the transgender people have hardly got congenial environment and proper facilities for education. The highest educational attainment of transgender people is higher secondary level and this rate is only 3.33 per cent and all of them are below 30 years. About one-third of them (32.5%) as well as the highest number of them have completed primary education and majority of them (76.92%) are in the ages of 10-30 years. Besides, the second highest number of them have attained in secondary level and this rate is 30 per cent. Also, the major portion of them are in 10-30 years. It is also seen that a notable number of them (15%) can sign only and half of them are in the ages of 20-30 years. More disquieting that about one-fourth of them (22.5%) cannot able to read or write and the highest number of them (39.13%) are in the ages of 20-30 years (Figure 5.2) (Table 5.5).

Training of transgender people:

Due to lack of satisfactory educational attainment, some transgender people have received training in different trades to get job or involve in any income earning activities. But this rate is only 30.83 per cent of total transgender people. Among them 11.67 per cent, 5.0 per cent and 14.17 per cent have received training from governmental, non-governmental and both of governmental-nongovernmental organizations, respectively. The highest 15.0 per cent of total transgender people have received training on sewing and second highest (11.67%) on livestock. Nearly same number of them are trained on parlour and computer and this rate is 10.0 per cent and 9.17 per cent, respectively. Besides, some of them have got training on hatchery, child rearing, boutique, saloon, outsourcing and other trades and this rate is 12.5 per cent, (Figure 5.3). It is also mentionable that more than two-thirds of them (67.57%) who have received training, are in the ages of below 30 years and 27.03 per cent are in the ages of 30-50 years. A little portion of them (5.41%) are in 50-60 years.



Sources: Field study, 2018

Table 5.5 Educational status of transgender people by age group

Educational status	Age group (years)					Total (number of respondents) (N=120)
	10-20	20-30	30-40	40-50	50-60	
Illiterate	8.69	39.13	26.09	8.69	17.39	100.00 (23)
Sign only	5.56	50.00	16.67	16.67	11.11	100.00 (18)
Primary	17.95	58.97	23.08	0.00	0.00	100.00 (39)
Secondary	27.78	47.22	13.89	11.11	0.00	100.00 (36)
Higher secondary	25	75.00	0.00	0.00	0.00	100.00 (4)

Source: Field study, 2018

Arena of interest of transgender people to involve income earning activity:

In terms of involving income earning activities, the arena of interest of transgender people is multifarious. Though they are not so educated and the highest number of them (15.0%) have received training on sewing, the major portion of them (29.17%) would like to involve in tailoring as income earning activity. The second highest number of them (21.67%) expect to involve in any kind of business. Besides, involve in parlour, boutique shop is some of their desire and this rate is 19.17 per cent, 12.5 per cent, respectively. More exciting, some of them want to be artist and government employee and this rate is 3.33 per cent in both cases. Moreover, 12.5 per cent of them are interested to be involved in nursing, teaching, banking, computer operating, farming, police sector, and garments sector. However, a few portion of them (9.17%) have no interest to involve any kind of work.

By analyzing the educational attainment, training and the arena of interest of transgender people some questions are arisen and that are- "Are they not interested to mainstreaming themselves into development? Are their jobs not fulfilling their interests or there are other causes behind not to involve any work?" Present study reveals that 15.83 per cent of them are interested in nursing, teaching, banking, computer operating, farming, police sector, garments sector even artist and government employee. But they have not the required educational qualification or training to get those jobs. Besides, 17.5 per cent of them have received training on livestock, hatchery, child rearing and other trades but none is interested to involve in those sectors. However, a few portion of them (9.17%) have no interest to involve any kind of work. So, there exist a clear-cut gap between cup and lip. Moreover, 30.84 per cent of them have got training service but none of them has been sanctioned for post training loan.

5.3 Inclusion in development

Government- non-government services for transgender people:

Since 2012-13 budgetary years the government has been implementing the living standard development program for the transgender community. Though majority of transgender people (91.67%) have the idea about those services, about three-fourth of them (72.5%) have no access to any kind of those services. The highest number of them

(25.83) have got training service but none of them have been sanctioned for post training loan. A limited portion of them (8.33%) have the access in educational scholarship. Only 3.33 per cent of them have the access to senior or special grant as a few of them (5%) are over fifty years. Besides, more than half of them (56.67 %) have no idea about non-government services. Consequently, majority of them (79.17%) have no access to those services. And who have the access, only 19.17 per cent, 1.67 per cent and 2.5 per cent of them have got training, educational support, and others, such as health care service, respectively (Table 5.6).

Table 5.6 Idea and access to GO and NGOs services

Types of services	Government services		Non-government services	
	Idea about services (N=120)	Access to services (N=120)	Idea about services (N=120)	Access to services (N=120)
Educational scholarship/support	16.67	8.33	1.67	1.67
Training	57.5	25.83	33.33	19.17
Post training loan	30.00	0.0	15.0	0.0
Senior / special grant	87.5	3.33	32.5	0
Others	0.0	0.0	22.5	2.50
No idea/ access	8.33	72.5	56.67	79.17

Source: Field study, 2018

Note: Multiple responses table

In terms of inclusion of transgender people in development programs, it is unveiled that only 27.5 per cent are included in it, though this rate is higher (45.49%) in national level (in number that is 5,745 out of nearby 12,629 transgender people in 2022-23 budgetary years) (Table 1.1 & 5.6). However, extensive inclusion of them in all those services as well as social safety net programs can push forward them into development.

Expectations and recommendations of transgender people towards abolishing their life challenges, promoting life standard and inclusion in development:

Unambiguously, transgender people expect to abolish their life challenges through resolving their entity crisis. For this every one of them (100.0%) demand to optimistic outlook from others towards them. Besides, recognition as distinct or 3rd gender virtually is another hope of all of them. Moreover, they have several demands to government. Government interference to get the right of patrimony is one of them and this rate is 62.5 per cent. Besides, 55 per cent, 7.5 per cent expect to government their voting right, religious identity, respectively. To get ensure about fundamental rights from all sphere, housing facility, and special hospital services are expected by 30 per cent, 72.5 per cent, and 4.66 per cent of them, respectively. In terms of skill development and inclusion in

development, some of them (10.83 %) expect exact database through distinct census that helps the government to formulate concrete development plan for them. Besides, about three-fourths of them (72.5%) expect employment facility and one-fifth of them (19.16%) claim special quota in education and job sectors (Table 5.7).

Transgender people recommend some issues to attain those expectations. To abolish their entity crisis about two-thirds of them (63.33%) recommend effective government policy in '3rd gender issue' formulation and implementation. In terms of growing positive viewpoints, more than two-thirds of them (70.83%) suggest to arrange seminar, meeting. Regarding skill development and inclusion in development about half of them (48.33%) recommend to expand skill development training through GOs and NGOs. Besides, a major portion of them (77.5%) recommend to abolish nepotism and corruption in employment. And 36.67 per cent of them recommend mutual cooperation from all corners from society to abolish their entity crisis, skill development and social inclusion (Table 5.7).

Table 5.7 Expectations and recommendations of transgender people in promoting and including them into development

	Types	Percentage
Expectations	Government initiatives to get the right of patrimony	62.5
	Positive lookouts toward transgender people	100.0
	Special quota in education and job sectors	19.16
	Recognition as 3rd gender virtually	100.0
	Distinct census for exact database	10.83
	Special hospital services	4.66
	Religious identity	7.5
	Ensuring fundamental rights from all spare	30.0
	Employment facilities	72.5
	Housing facilities	72.5
Ensuring vote right	55.0	
Recommendations	Effective government policy in '3rd gender issue' formulation and implementation	63.33
	Abolishing nepotism and corruption in employment	77.5
	Expanding training towards skill development through GOs and NGOs	48.33
	Growing positive viewpoints through seminar, meeting	70.83
	Mutual cooperation to abolish all their crisis	36.67

Note: Multiple responses Table

Source: Field study, 2018

The expectation and recommendations of transgender people indicates that some issues should be prioritized and emphasized to combat their life challenges, promote life standards and include them into development. Hence, the concrete strategies and action plan should be formulated with the exact database of them for addressing the constraints and push forward them into development. Besides, expanding education should be the most priority issue due to the illiteracy and sign capability rate is 37.82 and 55.56 per cent among the ages of 10-30 years (Table 5.5). Moreover, interest basis pragmatic skills, skills recognition, certification, special quota in job sectors, expanding senior grant, social safety net coverage as well as affirmative social outlook towards them is needed for awaking their capability, self-esteem, responsibility, and mainstreaming them into development.

Conclusion

Included the socially excluded people into 'Social Development Framework' through legislative and affirmative actions is one of the core agendas of Government of Bangladesh. So, eliminating misinterpretation, condemnation, discrimination, punitive practice towards transgender people like other excluded group and availability of social security and legal services from law enforcement authorities can be ended their entity crisis. Along with, there is no alternation to turn them into human capital if leading them towards development and mainstreaming them into society. Skilling, promoting and including the transgender people into development through considering their interests will be the main filament to address their challenges. Besides, in considering their expectation and recommendation distinct database, special quota system in education and job sectors, employment creation, expanding skill development training program can be examined and necessary steps can be taken to abolish discrimination, physical harassment in work place, obsequiousness to employer, and other issues. As a consequence, it will be possible to fulfil one of the strategies of 7th FYP for sexual minority groups- "the vision is a society where sexual minority groups, i.e. transgender, can live with respect and dignity and enjoy tolerance and social justice" (GoB, 2015: 649).

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১. লেখা A-4 সাইজের অফসেট সাদা কাগজের এক পৃষ্ঠায় ৪ (চার) দিকে ১ ইঞ্চি মার্জিন রেখে ২(দুই) স্পেসে কম্পিউটারে মুদ্রিত হতে হবে। বাংলা অথবা ইংরেজি যে কোনো ভাষায় লেখা জমা দেয়া যাবে। বাংলার ক্ষেত্রে Sutonny MJ ১৩ ফন্ট এবং ইংরেজির ক্ষেত্রে Times New Roman ১২ ফন্ট ব্যবহার করতে হবে।
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ISSN 2311-3626