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Editor's Note

The Bangladesh Journal of Political Economy (BJPE) accommodates only the selected papers submitted for publication. All the papers are duly reviewed by internal and external reviewers with remarkable endurance and finally concurred by the Editorial Board for publication.

The contemporary world is governed by a small fraction of people and policymakers. This age is characterised by many things detrimental to the existence of organised human society. These include rising inequality (wealth, asset, income, health, education), multidimensional poverty, various forms of fundamentalism and extremism, war and war-like situations, weaponisation of economies, climate catastrophe, artificial intelligence, and financialisation of the economy politics, unjust globalisation, authoritarian regimes, xenophobia. For her existence and progress, the organised human society shall endeavour to do everything to eliminate all the above-stated. In doing so, we must search for enlightened persons and institutions who will stress a new arena of building a decent society and explore how to develop a unique way of resisting the assaults of those who think for the ordinary people and accordingly mould the ideas of transforming human deprivation into humane development and related activism.

Interlacing more implicative ideas and writing with a deep understanding argues for a compelling and compassionate study of the ground realities that will rightly shape the course of human development history. We are hopeful that this journal will help monitor the current global debates in development thinking and practice from a broad-based interdisciplinary perspective. Besides, it will keep arduous and interested writers in touch with the cutting edge issues of lasting human development, thinking action and sound strategies. More importantly, we are confident, the papers are censorious, innovative, and thought-provoking, written with the best endeavour by a galaxy of eminent scholars and young, dynamic and talented authors. This journal, as expected, will be an essential resource for social science faculties and research institutions, international development agencies and NGOs, policymakers and analysts, graduate teachers and researchers who have always intended to build up a decent society.

We express our heartfelt gratitude to the credible authors, reviewers, and members of the Editorial Board of the Journal and others who have toiled much to raise the standard of this issue.

Abul Barkat, PhD

Editor, Bangladesh Journal of Political Economy
President, Bangladesh Economic Association

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Implementing Sustainable Development Goals in Bangladesh

Qazi Kholiquzzaman Ahmad*

Abstract

The purpose of this paper is to accomplish the following: to make a quick review of the notable socio-economic progress Bangladesh has achieved, particularly in recent years, citing statistical evidence as far as available; examine the relevance to Bangladesh of the sustainable development goals (SDGs) adopted by the United Nations in September 2015; and to discuss how Bangladesh is preparing to implement the 2030 Agenda for Sustainable Development, outlining the opportunities and challenges that may be faced.

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Bangladesh Marching Ahead: Reality Check

Bangladesh has done notably well in GDP growth and improvement in social indicators over the past eight years. During this period, the annual GDP growth rate has been over 6%, and, in 2015-16, it crossed 7%. In terms of US\$, the per capita income is estimated to have risen to 1,466 as of 2015-16.¹ Poverty is down to 24.8% and extreme poverty to 12.9%.² Overall, life expectancy at birth has

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¹ Finance Division, Ministry of Finance, Government of Bangladesh, Bangladesh Economic Review (BER) 2016, Dhaka, June 2016. p. 1 (Bangla version).

² General Economics Division (GED), Bangladesh Planning Commission, Government of Bangladesh, Millennium Development Goals (MDGs), Bangladesh Progress Report 2015, Dhaka, p. 21. It seems worthwhile to explain the basis of the measurement of these ratios. These ratios essentially represent income poverty because the cost of the basic needs approaches employed based on the cost of Kcal 2122 per capita/day and a small amount of money for a minimum of other basic needs (shelter, clothing, education, and health services) for poverty and a lower amount of money for the other needs keeping the cost of food intake the same for extreme poverty.

risen to an estimated 73.2 years as of 2016; it is higher for women at 74.4 years compared to 71 years for men.³

Bangladesh is one of a few noteworthy performers in terms of achieving targets under various Millennium Development Goals (MDGs). The country has fulfilled a significant number of critical targets, including in respect of poverty reduction, under-five mortality rate, the prevalence of underweight children under five years of age, gender equality in primary and secondary education, the proportion of children sleeping under insecticide-treated mosquito nets, deaths caused by malaria—on time (i.e. by December 2015) or well ahead of time. The progress has been significant in respect of several others, although the goalposts have not been reached. However, it should be noted that the achievement of Bangladesh within the framework of the MDG agenda has been accomplished, by and large, using its own financial resources and based on its own plans and programmes. Very little international assistance has been received specifically for the implementation of the MDGs. Even the official development assistance (ODA) has remained more or less stagnant as a percentage of GDP for most of the MDG years (i.e. over 2000-2015), tending to decline in specific years.

However, regarding the amount of money received annually, there has been a slight tendency to increase during the last few years.⁴ In addition to significant income growth and social development, financial achievements in recent years are also significant. The annually averaged inflation rate in 2015-16 has been 5.97%, down from 6.4% in the preceding year.⁵ Such a rate of inflation is realistic in the context of a developing country like Bangladesh. The foreign exchange reserves rose to a record level of US\$ 31.2 billion on 8 September 2016.⁶ Financial inclusiveness has also made significant headway. Many non-bank financial institutions provide financial services to the poorer segments of the population and increase banking services even in rural areas. Hence, even though the banking system remains shy in rural areas and among the urban poor, credit and other financial services are received by a considerable proportion of the poor households in rural and urban areas of Bangladesh.

A succinct statement on the progress achieved by Bangladesh up to now may be made, as follows. The rural economy of Bangladesh—agriculture (crop, livestock, fishery) and non-agricultural activities—is vibrant; exports are

³ See index mundi, web: indexmundi.com, Bangladesh: Life expectancy at birth.

⁴ See Table 9.1, Trends in ODA Disbursement, 1990-91 to 2013-14, MDGs: Bangladesh Progress Report 2015, op. cit.

⁵ Source: Bangladesh Bank.

⁶ Op. cit.

increasing, particularly of RMG and leather and leather goods, pharmaceuticals, and fish. The scope is expanding for increasing export of environment-friendly jute and jute goods. Remittances by Bangladeshis working abroad have sharply increased in recent years, reaching US\$15.17 billion in 2014-15.⁷ The penetration of Information and Communication Technology (ICT) has also been significant in recent years, not only in urban sectors but also in rural areas and mobile banking is a booming activity throughout the country. It may also be noted that employment is increasing in rural non-agricultural and other informal activities and urban informal sectors. The RGM sector accounts for a significant size of employment, of which women account for the preponderant majority. Elaborate safety-net (social protection) programmes exist and play a pivotal role in reducing extreme poverty. As of 2016-17, the budgetary allocation to these programmes accounts for 15% of the total budget or 2.5% of the GDP.⁸ There has been a significant improvement in women's status and involvement in the economy and society. Ministry-wise, women-focused budgets are now prepared.

Bangladesh suffers from widespread environmental degradation, and the country is at the forefront of climate change impacts. Concerning both, Bangladesh has developed policy frameworks and action programmes, which are being implemented in various sectors and areas of the country, particularly in vulnerable areas and for vulnerable segments of the population. Towards stemming environmental degradation such as water pollution, air pollution and destruction of water bodies; saving rivers from encroachment; and revamping forestry, the Government has been taking various steps but not to much avail so far, and the degradation has continued unabated. Good policies and legal provisions are in existence in the country to address these issues more effectively. What is needed is a robust application of these policies and laws. About climate change, the Government of Bangladesh adopted the key policy document, Bangladesh Climate Change Strategy and Action Plan (BCCSAP), in July 2009. Other relevant policies and strategies have also been developed. Further, the Government set up The Bangladesh Climate Change Trust Fund (BCCTF) in 2010; and, up to now, a total of Tk. 31,000 million has been allocated to it from the annual budgets over the past years since 2010. A significant number of projects have been or are being implemented utilising BCCTF resources.⁹

Bangladesh is also participating actively in international climate change

⁷ Bangladesh Economic Review 2016, op.cit., p. 70 (Table 6.2).

⁸ A M A Muhith, Budget Speech 2016-17, Ministry of Finance, Government of Bangladesh, June 2016.

⁹ See the website of the Bangladesh Climate Change Trust (BCCT), Ministry of Environment and Forest, Government of Bangladesh.

negotiations, focusing on the demand for a drastic reduction in greenhouse gas emissions by the developed countries in particular; and for international support in terms of financing and technology transfer, primarily for adaptive activities but also for appropriate mitigation activities in the developing countries, particularly the least developed countries (LDCs) and small island developing States (SIDS). Bangladesh has so far received minimal financial support for climate action. Bangladesh set up a Bangladesh Climate Change Resilience Fund (BCCRF) in 2011, but only about US\$190 million was pledged to it by bilateral donors, of which about US\$130 million was disbursed, and about US\$87 million utilised so far.¹⁰ Some international financial support has been received for disaster management and particular environment and climate change research and actions, but all of these do not add up to a very significant amount. On the other hand, funds needed for climate actions in Bangladesh run into billions of US\$.

Sustainable Development Defined

Overall, the data and analyses presented above show that Bangladesh is poised for take-off in economic terms and social development. Understandably, there are challenges to be addressed in this context, some of which will be discussed later at appropriate places. As indicated above, the country is also keenly pursuing climate actions to protect the environment and reduce the impacts and risks of climate change. At the same time, there is an increasing focus on the human being as both end and means of development. Thus, there exists in Bangladesh a basic conceptual framework for sustainable development, which is defined as a socially agreeable and environmentally sound economic growth, centring around the human being.¹¹

Equity is at the core of sustainable development from both intra-generational and inter-generational points of view.¹² Then, of course, with intra-generational equity, there are significant issues to address, including the preponderant socio-economic-political inequality or social exclusion, gender inequality within countries, and international inequality (inequality among countries).

¹⁰ Source: BCCT, op. cit.

¹¹ Agenda 21 was adopted in 1992 Rio (Rio de Janeiro, Brazil) United Nations Conference of Environment and Development, commonly known as Earth Summit. The definition is reiterated in *The Future We Want*, the outcome document of the Rio+20 Conference held in Rio in 2012.

¹² In *Our Common Future*, the 1987 Brundtland Commission (i.e. UN World Commission on Environment and Development) Report, sustainable development has been defined with reference to equity as 'sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs.'

Moving On: From MDGs to SDGs

The eight MDGs were picked, focusing on critical issues faced by developing countries, clearly disregarding the Millennium Declaration. This Declaration was a political document adopted by the United Nations General Assembly (UNGA) in 2000. There is no narrative invoking human and social values behind the MDGs so that these goals were not construed to generate a process of development based on a set of fundamental values and principles. The MDG goals and targets aim to address different population segments' deficits and sufferings concerning poverty, hunger, health services, education, gender equality, and environmental issues. On the other hand, the Millennium Declaration invokes fundamental values and principles, including human freedom; accountability; solidarity; tolerance; respect for nature; and shared responsibility for peace, security, and disarmament; human rights for all; protecting the environment, and eradicating poverty and protecting the vulnerable. Given that these values were not built into the MDG programme, inequality has steeply increased in most MDG implementing countries, despite progress in various MDG targets.

One other characteristic of the MDGs may be mentioned. Currently, intolerance and lack of solidarity permeate global and national orders, environmental degradation has continued unabated, and climate change intensifies. There is little to show concerning the shared responsibility of the global community towards establishing orderly progress of the global society under conditions of peace and security. It was not a requirement in the MDG agenda, as it was formulated, to address these issues. It was, in fact, a dependent agenda. It was to be implemented by the developing countries with financial and technological support from the developed countries.

However, the MDG agenda caught the imagination of the governments, civil societies and other stakeholders in the MDG implementing countries because these goals and the targets under them were formulated in a straightforward, simple, and easy to understand manner. Also, this has been the first global agenda to be implemented as such.

However, the Agenda constructed, focusing on the SDGs, differs from the MDG Agenda in certain fundamental respects. First of all, unlike the MDGs, this new Agenda is a transformative one, as is indicated by its title "Transforming Our World: the 2030 Agenda for Sustainable Development." (henceforth 2030 Agenda). Secondly, it is an Agenda for all the countries of the world while, as pointed out before, the MDGs were not. However, indeed, the priorities relating to the SDGs may be different for different countries, depending on their levels of development and circumstances. Thirdly, there is a narrative behind this Agenda, which spells out the fundamental values and principles on which it is anchored—

and as seen, there was none behind the MIDS. Thus, within the SDG framework, a world is envisaged where there will be "universal respect for human rights and human dignity, the rule of law, justice, equality and non-discrimination; of respect for race, ethnicity and cultural diversity; and of equal opportunity permitting the full realisation of human potential and contribution to shared prosperity. A world that invests in its children and in which every child grows up free from violence and exploitation. A world in which every woman and girl enjoys full gender equality and all legal, social, and economic barriers to their empowerment have been removed. A just, equitable, tolerant, open and socially inclusive world in which the needs of the most vulnerable are met."¹³

Based on these fundamental values and principles, it has been envisioned in the 2030 Agenda that no one will be left behind; sustainable development will be at the core of socio-economic transformation; economies will be transformed for jobs, and inclusive growth; peace and effective, open, and accountable institutions will be built for all; and new global partnerships will be forged to carry forward the 2030 Agenda.

A Brief Review of the Relevance of the SDGs for Bangladesh

The 2030 Agenda was adopted by the United Nations General Assembly (UNGA) on 25 September 2015. It is now under implementation in all the countries of the world. The Agenda consists of a total of 17 goals and 169 targets. Box 1 shows the 17 Sustainable Development Goals. Indicators to measure progress with the targets are being identified internationally. However, the indicators a particular country will be using should be determined based on their economic, social, and environmental realities and circumstances, both within the country and faced externally.

As said earlier, the priority ordering of the 17 SDGs as well as the targets under them will vary from country to country, depending on their internal and external circumstances and levels of development. For Bangladesh, I would suggest that the following four SDGs should be accorded top priority. Goal1: End poverty in all its forms; Goal2: End hunger, achieve food security and improve nutrition and promote sustainable agriculture; and Goals5 and 10: Achieve gender equality, empower all women and girls, and Reduce inequality within and among countries. All other goals and targets will come into play through organic linkages provided by the human centricity (leave no one behind) of the Agenda and the

¹³ United Nations, Transforming Our World: The 2030 Agenda for Sustainable Development, adopted by the UN General Assembly on 25 September 2015, para 8 of the Preamble.

fundamental values and principles on which it is anchored.

Despite unparalleled scientific and technological advancement and unprecedented global wealth creation in recent times, 836 million people

Box 1: 17 Sustainable Development Goals

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improve nutrition and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and quality education for all and promote lifelong learning
Goal 5	Achieve gender equality and empower all women and girls
Goal 6	Ensure access to water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote inclusive and sustainable economic growth, employment and decent work for all
Goal 9	Build resilient infrastructure, promote sustainable industrialisation and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts
Goal 14	Conserve and sustainably use the oceans, seas and marine resources
Goal 15	Sustainably manage forests, combat desertification, and halt and reverse land degradation, halt biodiversity loss
Goal 16	Promote just, peaceful and inclusive societies and establish accountable and inclusive institutions
Goal 17	Revitalise the global partnership for sustainable development

worldwide are still poor, having to make do with a per capita/day income of less than PPP\$1.25.¹⁴ Also, about 795 million people around the world still do not have enough food, in terms of quality or quantity or both, to eat; and 780 million of them are in developing countries.¹⁵ In Bangladesh, despite praiseworthy success achieved in reducing poverty and hunger, about 40 million people (24.8% of the total population) are still poor and about 20 million (12.9%) extremely poor, based on poverty measurement with reference to the cost of basic needs.¹⁶

A few statistics relating to the inadequacy of food intake in Bangladesh may be shown here. About 41% of children under the age of five years are chronically undernourished, and they are stunted (too short for their age); one-third of children aged six months to less than five years of age are anaemic; some 16% of under-five children are wasted (low weight-for-height); about 40% of school-aged children are iron deficient, and loss of productivity due to undernourishment accounts for about US\$ one billion and even more is incurred in healthcare costs.¹⁷ Income inequality is acute (GINI around 0.45 and income share of the poorest 5% being around 0.75% while that of the richest 5% around 25%), but it has been more or less unchanged in recent years.¹⁸ Social inequality is worse as the poor have little access to policymaking and implementation processes. Not infrequently, they are deprived of their legitimate economic and social rights. Therefore, elimination of poverty and hunger and reduction of inequality must be the top priorities in Bangladesh in implementing the 2030 Agenda. When more and more poor people are mainstreamed in the socio-economic transformation process, not only poverty and hunger reduction will take place, but, simultaneously, there will also be contributions to disparity reduction and GDP

¹⁴ UNDP, Human Development Report 2015, New York, p. 74. There are still 836 million poor people in the world is an affront on human ingenuity that has scaled such mindboggling heights in scientific and technological advancement and wealth creation. However, it should be noted that poverty reduction since 1990, when the number of poor people was 1.9 billion, is remarkable.

¹⁵ UN Food and Agriculture Organization (FAO), The State of Food Insecurity in the World 2015, p.8.

¹⁶ See endnote 2 of this paper.

¹⁷ See World Food Programme (WFP), '10 Facts about Hunger in Bangladesh', 20 April 2015. web: <<http://m.wfp.org/stories/10-facts-about-hunger-bangladesh>>

¹⁸ Bangladesh Economic Review 2016, op.cit., p.197 (Bangla version). 2010 UNDP Human Development Report estimated 1.7 billion people to be MPI poor and 1.4 billion incomes (PPP\$1.25) poor in the 104 countries included in that assessment, implying MPI poverty to be 21% higher than income poverty. 19. This difference in the poverty levels, measured following multidimensional and income poverty approaches, is based on MPI measurement using three dimensions (education, health, and living standard) and ten indicators. If more dimensions and indicators are used, the difference may be more extensive.

increase.

While target 1.1 under Goal1 proposes eradication of extreme poverty everywhere, measured concerning PPP\$1.25 poverty line, target 1.2 invokes multiple dimensions of poverty and proposes reduction at least by half the current proportion of multidimensional poor men, women, and children of all ages. The second target refers to the prevailing realities as there are multiple dimensions to human living and, hence, to poverty. Income alone cannot and does not tell the whole story.

The UNDP has been publishing multidimensional poverty indices (MPIs) for countries around the world since 2010. As it takes into account multiple indicators, multidimensional poverty is understandably higher than income poverty; and, as of 2010, the estimated number of multidimensionally poor people is 21% higher than the number of income-poor people in the 104 countries covered in that year.¹⁹

Not only that the MPI reflects reality more closely, but also it is conducive in the context of policy and programme development or adjustments as it pinpoints which aspect(s) of the living conditions that a particular group of poor people or an impoverished family or even a particular poor individual suffer(s) from. This MPI is the aggregation of the values of indicators/dimensions included. A particular group, for example, maybe deficient or poor in respect of food intake, children's education, access to electricity, access to clean drinking water, and institutional support for their particular economic activity. These issues can then be addressed in specific terms for the specific groups.²⁰

The adoption of the MPI approach for poverty measurement and poverty action by individual countries would give them a basis for more focused and relevant poverty action for different poverty groups.

Bangladesh has initiated a pilot project to field-test how best to measure multidimensional poverty, focusing on dimensions and indicators to be included and weights against them for aggregation, data generation and analysis. It is at a reasonably advanced stage of completion. One expects poverty measurement in Bangladesh will soon be conducted multidimensionally, which will be helpful for

¹⁹ For more on this and other references, see Q K Ahmad and Baqui Khalily, "Measuring Multidimensional Poverty Based on Evidence from Programmed Initiative of Monga Eradication (PRIME) in North-Western Bangladesh" in Q K Ahmad and Shafi Ahmed (eds.), *Bangladesh's Development: Some Issues and Perspectives—Essays in Honor of A M A Muhith*, published by Palok Publishers under the auspices of Palli Karma-Sahayak Foundation (PKSF), Bangladesh Unnayan Parishad (BUP), and Dhaka School of Economics (DSE), Dhaka, June 2016.

²⁰ On this one may consult PKSF website: www.pksf.org

more focused and specified poverty action for variously deprived populations.

As soon as poverty is (reduction/eradication of which is the topmost priority-SDG for Bangladesh, as proposed by the present author) is recognised to be multidimensional, health issues (SDG3); education (SDG4); water and sanitation (SDG6); access to energy (SDG7); growth, employment, and decent work (SDG8); combating of climate change (SDG13); and sustainable management of forest, combating of desertification, halting and reversing of land degradation and halting of biodiversity loss (SDG15) become crucially relevant. The goal of hunger eradication (present author's 2nd top priority-SDG for Bangladesh) reinforces the need to pursue the SDGs as mentioned above steadfastly. The goal of inequality reduction (present author's 3rd top priority-SDG for Bangladesh) also calls for effective implementation of the above mentioned SDGs.

Achieving gender equality and empowering women and girls (present author's 4th top priority-SDG) requires that, in implementing the above mentioned SDGs as well as in the case of all other SDGs, women and girls must feature appropriately, adequately, and effectively in both the implementation of the 2030 Agenda and equitably sharing of the outcomes thereof.

Relating to the country's socio-economic take-off, as discussed earlier and which is necessary for sustained poverty and hunger reduction and beyond poverty sustainable development, it is critical to give due attention to infrastructure development and upgrading (transportation, gas, electricity, ports); support and facilitate innovations; promote sustainable industrialisation suited to the existing and emerging relevant circumstances (SDG9). About take-off, another key area for particular focus is human capability development through quality education, appropriate skill training, and necessary health services, which has been noted earlier to be directly relevant for poverty and hunger eradication. Special attention needs to be given to young people. Bangladesh is now passing through a period with a huge potentiality of the demographic dividend to be realised. About half the potential economically active population is young. If this potential powerhouse of human capability can be developed and put to proper use, that will be a potent force strengthening the process of the country's socio-economic take-off and sustainable, robust forward march along a high trajectory.

There are opportunities and challenges in cities, where both much affluence and substantial poverty coexist. Poverty reduction and development actions in urban areas, particularly in large cities, hold great importance in the context of sustainable poverty reduction and development in the country. Some 65% of the national income is generated in the urban sector in Bangladesh, and almost 40% in Dhaka city alone. The challenges in the cities include pressure on social

services (education, health services, water supply, electricity, sanitation and other municipal services, transportation) due to unplanned rapid urbanisation and fast-growing numbers of city dwellers; sprawling slums with much poverty; very congested settlements. Opportunities include the availability of good educational institutions, quality health service facilities; issues surrounding the safety of life and property; marketing facilities; and linkage opportunities for mutual benefit between different economic activities and professional groups.

The issues of safety, inclusiveness, resilience and sustainability in the cities are recognised as SDG11. In implementing the 2030 Agenda in Bangladesh, therefore, appropriate policy planning and commensurate actions should be carried out to take advantage of the above-listed and other urban opportunities and effectively address the above-listed and other challenges for sustainable urban development, contributing significantly to poverty and hunger reduction/elimination, inequality reduction, and accelerated socio-economic progress in Bangladesh.

The relevance of SDG12 (Ensure sustainable consumption and production patterns) in Bangladesh can be explained as follows. Sustainability of production requires access to factors of production (notably, raw materials and other inputs, finance, skilled managerial and technical personnel) timely and adequately as well as to necessary infrastructural and marketing facilities. These requirements relate to agriculture, rural-non-agricultural activities, small and medium enterprises, and modern sectors. A major focus should be on productivity growth as productivity is low in Bangladesh in most sectors. Improved technologies and skills are essential requirements for enhanced productivity. These and other needs should be addressed based on the existing and emerging realities assessed through appropriate studies.

In the context of consumption, while inadequate access is a significant issue for the downtrodden, food quality is a major issue for all. Adulterated food has become a menacing health hazard in Bangladesh. It must be addressed effectively through both unflinching applications of law and widespread awareness-raising among all population segments.

On SDG14 (conserve and sustainably use the oceans, seas and marine resources), Bangladesh has a significant interest in marine resources, given that it has a long coastal belt and a significant stake in the Bay of Bengal. Beyond that, it may not play many roles in the context of conserving oceans and seas, but it should remain watchful on how things shape up in this regard.

SDG16 (promote just, peaceful and inclusive societies) provides the overall guiding principle. A fully inclusive society means that no one is left behind. For an orderly transformation of society, every member of that society should enjoy

their human rights and freedoms, secure their legitimate shares of development benefits, and participate meaningfully in the process of socio-economic-political transformation of society. This can materialise in a society that is just and peaceful, with the rule of law prevailing.

SDG17 is about the means of implementation of the 2030 Agenda. While individual countries have the pre-eminent responsibility for implementing the SDGs, the international community also has a collective responsibility for effective implementation of the Agenda as a global compact. It is essential to ensure a fair international trade regime, with some affirmative facilities for the LDCs and financial and technological assistance to the developing countries to meet the ability gaps they face in these regards, considering the optimal mobilisation of their domestic resources. What is essential is to forge these partnerships based on sovereign mutuality, fairness in the determination of responsibilities, and proper implementation and joint monitoring of the agreed actions of the parties entering into a partnership.

Towards 2030 Agenda Implementation in Bangladesh

This section outlines the action areas and directions in implementing the 2030 Agenda in Bangladesh.

- The Agenda seeks to bring about a societal transformation, equitably including everyone. To implement such an agenda, a high level of political commitment is vital.
 - ✓ In Bangladesh, a strong political commitment does exist. Buoyed by the country's exceptional performance in implementing the MDGs, the Government of Bangladesh actively participated in the formulation of the 2030 Agenda. The civil society input into that process from Bangladesh, often working in tandem with the Government, is also noteworthy.
 - ✓ The political commitment to the 2030 Agenda in Bangladesh has grown as a necessary concomitant of that involvement, which, in turn, has arisen from the Government's commitment to the eradication of poverty and, beyond poverty, sustainable development including all citizens of the country in the process.
 - ✓ A reflection of the strong political commitment of the Government of Bangladesh led by Prime Minister Sheikh Hasina to the 2030 Agenda is that a Committee on Sustainable Development Goals: Implementation and Review was set up in the office of the Prime Minister under the Chairmanship of the Principal Secretary to the Prime Minister on 25 November 2015, only two months after the Agenda was adopted by the

United Nations and Bangladesh signing into it and more than a month before it came into force on 1 January 2016. In about only ten months, the Committee has accomplished an appreciable amount of basic work.

- √ The Committee has been working on indicators to measure progress against targets, specifying tasks to be carried out under different SDGs, and identifying which ministry or agency would perform what responsibilities and which tasks. It is also assessing the potentiality of domestic resource mobilisation for implementing the 2030 Agenda. The flip side of this exercise gives the estimates of resources to seek from external sources through global partnerships. The Committee's work will undoubtedly facilitate effective implementation of the Agenda.
- In preparing the way forward, the challenge or possible setback or backward slide in any respect must always be kept in perspective. For example, some people who have moved above the poverty line may face the prospect of falling back to poverty due to an impending natural disaster. In this context, a mechanism and an analytical framework need to be put in place for identifying such a possibility and putting in place, in response, action programmes to prevent it from occurring if possible or reduce risks and impacts thereof in case of its occurrence and to take action to recoup the situation as quickly as possible it does occur. In this case, prevention by human action is not an option, but steps need to be taken to reduce risks in the first place and then, if and when it does happen, undertake appropriate activities to enable the people concerned to recover as quickly as possible from the socio-economic setback suffered by them. Moreover, there should be ongoing action programmes to reduce disaster risks.
- To maximise benefits from the available resources and human and institutional capabilities, importance-ordering of the SDGs and priority-ordering of the tasks to be undertaken to the targets under different SDGs should be worked out. However, once such a plan is prepared and used to guide SDG implementation actions, it should be reviewed and revised periodically, considering the experiences gathered and the available new knowledge and analyses of ground realities that may be changing.
- In addition to the central government's critical role, local governments can and should play a major role in mobilising local resources and facilitating and supporting local actions under various SDGs. However, the Government alone cannot implement the 2030 Agenda successfully. The participation of all other stakeholders such as civil society, the private sector, education and skill development sectors, the financial sectors, and the people at large through community-based organisations is essential. For contributions from

all these actors to be marshalled towards a successful implementation of the 2030 Agenda, there needs to be effective coordination among government ministries and other agencies, between the central and local governments, and between the Government and all other stakeholders and actors.

- Not infrequently, coordination gaps bedevil effective implementation of policies and programmes in Bangladesh. It is, therefore, essential to develop a robust coordination mechanism so that the best possible results are obtained through coordinated actions of all the actors, which can ensure the best possible utilisation of the available resources towards achieving the targets set.

In addition to the need for improving coordination, there are several challenges to address in the process of 2030 Agenda implementation, which includes the following.

- In the 2030 Agenda itself, it has been recognised that a successful implementation of the Agenda, a data revolution is necessary. Detailed data on the ground realities are needed for adequately designing action programmes and measuring progress against targets. In Bangladesh, gaps are daunting in this regard. A research and data gathering and analysis programme, keeping in perspective the 2030 Agenda implementation plans and guidelines developed, needs to be designed with proper prioritisation and implemented. This is a critical action area for which external resources may be tapped in a major way.
- Another area of action is to develop, revamp or strengthen institutions congruent with the policies and strategies adopted for 2030 Agenda implementation. This is surely a complex task, but one that needs serious attention. The Agenda itself recognises the importance of policy and institutional congruence for its proper implementation. It may also serve a useful purpose if assigning responsibilities and tasks are rearranged—such as giving local governments a major role in local actions.
- Monitoring of the implementation of the SDG action programmes focusing on the concrete results being achieved is a must to understand the extent and quality of the outcomes regarding the targets set. Thorough monitoring is also important for identifying if there are any mission drifts, undesirable episodes, existing or emerging bottlenecks, inefficiencies and so on, enabling the authorities to undertake corrective measures.
- A major challenge is a large-scale need for human capacity development and improvement at all levels of society and human action areas. The essential means to this end includes education, skill development, and health services. In all these areas, there have been significant advancements in the country in

recent years. However still, there are major gaps. Functionally educated (meaning reading, writing, understanding, expressing, communicating, and accounting skills are at a level that gives the persons concerned a respectable level of abilities and confidence) proportion of the adult population is perhaps about 50%, skill training covers a negligible proportion of even the youth segment of the population, and affordable and quality primary health services remain way short about the goal of universal primary healthcare coverage. Illiterate people need to be educated and trained. The literates and those with higher levels of education need appropriate skill training in their respective chosen fields. Higher-level functionaries in all sectors need exposure nationally and internationally, as the case may be. How best to develop and improve the human capabilities, over the coming years, at various levels and in different areas of human endeavour must be appropriately planned concerning the projected requirements over the years, derived from the planned 2030 Agenda implementation processes. However, besides this process, many more skilled people will be needed in other areas of human endeavour in the country, which must also be kept in perspective in planning human capability development and improvement in Bangladesh.

- Financing the implementation of the 2030 Agenda is going to be a considerable challenge. It is expected that individual countries will mobilise domestic resources to the maximum extent possible for implementing this Agenda. This would require improved public revenue collection mechanisms to eliminate evasion and leakages and extend the tax net to cover the potential taxpayers who are not paying taxes now. The Government has been taking steps in terms of, for example, simplifying the tax payment procedure, the introduction of online payment facilities and encouraging people to use these, according to recognition to major taxpayers, and raising awareness through tax-fairs and other means about the liability of those who have taxable incomes to pay their taxes. Efforts should be strengthened to identify tax evaders and bring them to book to discourage others from traversing this path. Then, other sources of funding that should be tapped for implementing the Agenda include civil society and community-based organisations, the private corporate sector, people of small means interested in micro-enterprises, foreign direct investment (FDI), and official development assistance (ODA) from the developed countries.

✓ Many civil society and community-based organisations were enthusiastically active in promoting MDGs and are already gearing up to play a part in 2030 Agenda implementation. Although these organisations

may not raise many funds for tasks to be undertaken, they can undertake awareness-raising, monitoring, and review activities to help effectively utilise funds and focused implementation of the Agenda.

- √ The private sector, particularly the corporate segment, needs to prominently because of its prominent role in the nation's economic progress. The private investors have a responsibility to ensure that their undertakings are managed to contribute to economic growth that is socially agreeable and environmentally sound. By so doing, they will be contributing to a sustainable future of their own industries and businesses as well. The Public-Private Partnership (PPP) mechanism, which has been in place for quite some years, maybe revamped for utilisation to mobilise the private sector to contribute to sustainable development in coordination with the Government and other stakeholders.
- √ If facilitated and supported, people of small means, mainly rural areas, can mobilise their own funds and generate income, employment, and savings. They may be encouraged to use whatever savings they may have or whatever funds they may be able to raise by extending credits to them for the additional funds required for undertaking micro-scale enterprises—in which total requirement is, by and large, the equivalent of US\$5,000 or US\$10,000. Even if they cannot initially invest from their own sources and the fundamental requirement is made available in terms of credit, they soon start to improve their economic conditions and generate savings for investment. However, only making money available to them is not enough. They must also be simultaneously provided with assistance in securing market information, skill training, assistance in accessing appropriate technologies, and assistance in marketing products. The experience of the Palli Karma-Sahayak Foundation (PKSF) is that there is tremendous interest among large numbers of rural people around the country who, if assisted as indicated above, take up such activities.²¹
- √ Foreign direct investment (FDI) in Bangladesh is relatively low. It has, however, tended to increase slightly recently, topping US\$2 billion in 2015. To attract more FDIs, adequate attention must be given to ensuring political stability, improving the business environment, and improving infrastructural facilities such as transportation, ports, gas and electricity supplies, and timely disposal of the required official actions.
- √ Bangladesh should strengthen efforts to establish beneficial global partnerships to meet the resource gaps after maximum possible mobilisation of domestic resources in respect of ODA. The principle of common but differentiated responsibility and respective capabilities

provide a sound basis for these partnerships to be worked out. Because, in the interest of effective 2030 Agenda implementation in the developing countries, particularly the LDCs and SIDS, the additional financial resources, appropriate technologies, and capacity enhancing support that they may need should be provided by the international community. This is also a must from the point of view of reducing international inequality, i.e. inequality among countries.

- Corruption is pervasive in Bangladesh and is another major challenge in the context of 2030 Agenda implementation. It causes siphoning off and wastage of resources, delays in decision making and implementation, and, not infrequently, makes for wrong targeting. It may be different in nature, scale, and methods used, but corruption is worldwide. It is also a much talked about subject in Bangladesh and also internationally. In Bangladesh, there are policies and laws against corruption; and there is also a dedicated agency, Anti-Corruption Commission (ACC), to take action against corruption. However, all this has so far been of little avail in practice in reducing corruption to any significant extent. More focused, purposeful, honest and coordinated action is essential for achieving results in meaningfully reducing corruption in the first instance while striving to increase successes over time. SDG16 calls for promoting just, peaceful and inclusive societies and establishing accountable and inclusive institutions. This SDG should be accorded the high importance it deserves in the context of steadily taking the sustainable development agenda forward.
- Terrorism is an international menace that kills and maims people who are often innocent. It can hinder the implementation of the 2030 Agenda through its destabilising efforts. Needed anti-terrorist activities claim resources that might otherwise have been available for economic and social purposes. In Bangladesh, the Government policy stance is zero tolerance in respect of terrorism. From time to time, however, terrorist activities of one sort or another have taken place in the country. However, the Government's stern action in recent times, particularly during the last several months, has reduced the possibility of terrorist activities taking place in the country to a minimum now. All the known terrorist groups operating in Bangladesh are now subdued by decisive policy actions and are under elaborate surveillance. However, continuous vigilance is essential to prevent likely terrorist acts. At the same time, it is also necessary to watch out for any new terrorist groups or individuals who may try to raise their heads from within the country or without and take necessary action to nip any such possibility in the bud.

Concluding Remarks

Having done notably well in terms of economic growth and social development and achieving a high level of success concerning the overall implementation of the MDGs, in an accelerated manner in recent years, Bangladesh is now poised for moving on to a higher trajectory of development. The 2030 Agenda will help galvanise and strengthen the process. In this paper, a reality check has been made of the successes achieved, the SDGs have been reviewed about their relevance to and priorities for Bangladesh, and action areas and directions for effective 2030 Agenda implementation have been outlined.

Indeed, in any economy or society moving forward, there may be some unresolved problems outstanding from the past; and other new problems may also arise from time to time. It is essential to seriously address the outstanding problems and regularly watch through an appropriate review mechanism to identify any new problems threatening to arise. In the case of the possible new problems, the endeavour should be made to identify them in advance and prevent them or put in place policies, and strategies to address them effectively should any or all of them arise.

From Bangabandhu to Viswabandhu: Towards Global Liberation through Public Reasoning

Haider A. Khan*

Abstract

This lecture will be based on a modest book length contribution which is the second in my decades' long project towards writing a truly global history of our liberation struggle. I have followed a particular strategy in trying to capture the global within the local here. I have also endeavoured to present the macrocosm of tumultuous postcolonial politics in South Asia since 1947 through the independence of Bangladesh and its recognition by the World by 1974 through the political life of one key actor, Bangabandhu Sheikh Mujibur Rahman and his progressive democratic revolutionary companions from all sectors of today's Bangladesh. One of the main theses of this book is that Bangabandhu was an emotionally mature, thoughtful and courageous human being who valued democratic public reasoning deeply.

JEL Classification B24 · B31 · N01 · F54

Keywords *Liberatory · Thoughts·History of Economic Thoughts of Bangabandhu · Political Economy History*

I present authentic new translations of Three of Bangabandhu's most important speeches during the period 1970 to 1974 and build my narrative and analysis around the important historical events and processes surrounding these. My main purpose is to let an international readership—especially young people who are looking for a way out of the present global crisis—know that the political ideas, strategies and tactics of Bangabandhu are relevant—within proper historical limits—for our crisis-ridden period of struggle. The proposition that this work

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needs to be done has several justifications. The most important one from a historical perspective is that the history of our liberation movement has already been distorted by both the extreme right and the extreme left with the middle in great confusion.

Bangabandhu in death needs neither adulation nor condemnation but rather the country needs an objective evaluation of the most important ideas that motivated millions of people during their struggle for self-determination. In many ways, Bangabandhu embodied symbolically their aspirations and his ideas concentrated the inchoate but deeply felt needs of the people. The secular democratic and socialist ideals of politics and political economy are the most important here. Undoubtedly, there is much to be criticized if for no other reason than simply for incompleteness. Therefore, my aim here is also to extend the discussion in several useful directions for the future. This is undertaken in the concluding part of this book.

Finally, the present effort may also be considered in light of the emerging frontier areas of research on narrative politics (Mayer, 2014) as well as the more radical post-Bakhtin analytical approach to narrative form as a polyphonic discourse of the people. My research emphasizes the construction of public and collective goods through the use of common narratives and original interpretations for advancing the common good. In the East Pakistan of the 1960s the construction of the six points and 11 points programs in light of the theory of two economies advanced in the 1950s and 1960s by a group of Bengali economists can be insightfully seen from this new perspective of narrative politics.

An important methodological point also needs to be mentioned at the outset. This short investigation of both the narrative structures of three of the most significant speeches of Bangabandhu is also an attempt to present both the objective and the subjective factors that led to the independence of Bangladesh on 16 December, 1971. This is done through both a dispassionate analysis of the objective factors within the limited space here. For the subjective factor, the organization and structure of the new AL under Bangabandhu and other progressive political forces were the most important. Intricately interweaved with these subjective factors were also the personalities and actions of the leading figures that included not only Bangabandhu but also Maulana Bhashani, the other leaders of NAP and the communist party, the young student leaders and many others at the local levels. It is impossible to do justice to all of them in a short book. Here, I have chosen three speeches by Bangabandhu to highlight his discourse and leadership. However, one of my theses is that Bangabandhu is symbolically far greater than the person who was called by that title. Through his

consistent and courageous judgements and actions his subjectivity merged with the objective forces of the history of Bengal, of South Asia and ultimately, the whole post WW2 world.

সময়কে উদ্ধার করি, চলো

আমি হারিয়ে যাওয়া সময়কে উদ্ধার করতে গিয়ে দেখি
ছবিটা আজও ঝুলছে
বহুদিন ধরে একই জায়গায়—রোজই চেয়ে চেয়ে দেখি
রোজই নানান কাজের ভিড়ে হারিয়ে ফেলি তোমাকে

আজ আমি হারিয়ে যাওয়া সময়কে উদ্ধার করতে গিয়ে দেখি—
আগের চাইতেও আরো জীবন্ত

তোমার সেই মুখচ্ছবি তোমার সেই আয়ত দৃষ্টি
অনেক দূরে টেনে নিয়ে যায় মরচে-ধরা মনের আয়নায়
আবারো ভেসে ওঠে অনেক আগের এক বসন্তের ছবি

হঠাৎ আলোর ঝলকানি জাগিয়ে তোলে অনেক আগের এক বসন্তের ছবি

সেদিনও তো এমনি ছিল, সেদিনও তো ফুটেছিলো ফুল—তারারা আলো জ্বলেছিলো...
কোকিলও ডেকেছিল বুঝি

বাংলার বিষাদের দুঃখভরা দিন দুর্দিনের ইতিহাস শেষ হবে, এই জেনে

আজ চেয়ে আছি আমরা সকলে তোমার চশমার চূর্ণ টুকরোর দিকে
তোমার নিভে যাওয়া পাইপের পানে
দুর্দিনের ইতিহাস শেষ হবে এই জেনে
প্রার্থনায় নতজানু আমরা সবাই
ফিরে এস, হে বান্ধব
ফিরে এস, সাহসের আগুন জ্বালাতে
ফিরে এস, সান্নিধ্য জমদগ্নি
বাংলার অগ্নিপুরুষ
সাহসী মানুষদের নিয়ে আবার
শুধু আর একটিবার
সেই সাহসী সময়টাকে উদ্ধার করি, চলো

কাহ্নপাদ হায়দার (হায়দার আলী খান)
ডেনভার, জানুয়ারী ২০২০

Let us redeem our time
I went to redeem le temps perdu—the lost time
Saw your picture still hanging in the same place
Lost to my consciousness in the swirl of everyday life
Today I want to redeem le temps perdu—the lost time—
Your face looks more alive than before
Your eyes opening an immensity before me
Takes us far, far away—the rusted mirror of my mind
Shows the picture of another Spring long time ago
A sudden shaft of light floods my memory
That day was like today with flowers blooming—stars sent their faint light
Perhaps the cuckoo was singing then too
Hoping that the sorrows of Bangla, the nightmare of history will finally be over
Today I am looking at the broken pieces of your eyeglasses
Today I am looking at your extinguished pipe
Knowing that the nightmare of history will end
We all bow in prayer
Come back, our friend!
Come back to light the fire of courage
Come back like the fiery sage Jamadagni
Come back the intrepid son of Bengal
Come back just to gather all with courage
just once more
Come, let us redeem that time without fear
Let us march together.
Facing the force of future

Kahnupad Haider (Haider A. Khan)
Denver, Colorado, USA, January 2020

What Determine the Profitability of Commercial Banks in Bangladesh? Evidence from Econometric Analysis

Dibosh Kumar Mondol*
Md. Abdul Wadud**

Abstract

This study investigates the impact of bank-specific and macroeconomic factors on the profitability of commercial banks in Bangladesh, capturing the period from 2009 to 2018. The secondary balanced panel data are taken to analyse as a sample of 12 commercial banks for 120 observations. Profitability is measured by return on assets (ROA) which is affected by bank-specific (internal) factors such as bank size, capital adequacy, liquidity, deposit, operating efficiency and non-traditional activities that can be controlled by the bank management and macroeconomic factors (external) such as GDP growth rate and inflation rate. The study applies the random effect (RE) model, which the Hausman specification test has chosen. Further, the study applies the generalised methods of the moment (GMM) to control the effects of heterogeneity within and between panel groups. The empirical results from the random-effect model suggest that bank size, liquidity and GDP growth rate have had a negative and significant impact on bank profitability. The results also show that capital adequacy, deposit, operating efficiency and non-traditional activities are positively and significantly related to the profitability of commercial banks. The generalised methods of the moment (GMM) reports that bank profitability is positively and significantly

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affected by capital adequacy, deposit, operating efficiency, and non-traditional activities positively and significantly. In contrast, liquidity has had a significant negative impact on the profitability of commercial banks in Bangladesh.

JEL Classification G21 · E30 · C1

Keywords Return on Assets (ROA) · Internal and External Factors · Random Effect Model · Generalised Methods of Moments · Commercial Bank in Bangladesh.

1. Introduction

The financial system of Bangladesh is dominated by the depository institutions that collect deposits from individuals and organisations and provides loans. Like other modern banks, deposit institutions collect and distribute money to different entities and provide many services to various entities that facilitate their business operations. According to Fama (1980), banks are such types of business wherein deposits are considered liabilities and issuing debt securities are considered assets.

An efficient financial system improves banks' profitability by increasing the amount of funds available for investment while enhancing the quality of services provided for the customers (Soana, 2011). Thus banks open up secure channels of savings and investment, which are most vital for promoting economic growth. Recently, the financial sector has become the main driving force and pillar for accelerating the economic growth of modern economics in Bangladesh. The banking system plays an essential financial intermediary role, and they are considered the backbone of economic growth. Almost all the economic activities are integrated with the functions of banks. However, the health of banking financial institutions is critical to the health of the general economy at large. The banking sector of developing countries is less stable than developed countries (Uddin and Suzuki, 2011).

Bangladesh has a hybrid banking system that comprises six state-owned commercial banks (SCBs), 40 commercial banks (PCBs), nine foreign commercial banks (FCBs) and two specialised banks (SBs). The Central Bank of Bangladesh, the Bangladesh Bank, formulates and implements monetary policies and regulates the country's banking sector. Although Bangladesh Bank has been taken some policies to stabilise the financial system and regulate the banking sector in Bangladesh, it is still relevant to know what factors affect the profitability of commercial banks to influence policymaking in the banking sector in Bangladesh. Given the relationship between the well-being of the banking sector and the growth of the economy (Rajan and Zingales, 1998), understanding

the essential factors that influence the financial sector's profitability is therefore crucial not only for the managers of the banks but also for numerous stakeholders such as the central banks, bankers' associations, governments, and other financial authorities. There are many factors of bank profitability as a measurement that would be useful in helping the regulatory authorities to formulate future policies aimed at determining the profitability in the banking sector of Bangladesh. In addition, different market and macroeconomic factors also influence the ability of the banks to make profits (Short, 1979; Molyneux and Thornton, 1992; Athanasoglou et al., 2008). Thus, bank-specific (internal) and macroeconomic variables (external). So, this study examines the internal factors like bank size, capital adequacy, liquidity, deposit, operating efficiency and non-traditional activities and the internal factors like GDP growth rate and an inflation rate that influence the determinants of profitability of commercial banks in Bangladesh.

2. Literature Review

Different studies in different countries around the world have been conducted to investigate the factors that influence banks' profitability. To understand the basic concepts and framework, some prior literature review is reported. Bhogale (2019) investigates factors of bank profitability of fourteen private commercial banks in Ethiopia over the period from 2008 to 2017 using unbalanced panel data. Fixed effect regression results reveal that capital adequacy and bank size significantly affect bank portability. In contrast, operation efficiency has a significant negative effect on profitability, but liquidity risk and credit risk are not essential variables determining bank profitability. Among macroeconomic variables, foreign exchange rate and lending interest rate have a significant negative effect on the profitability of Ethiopian private commercial banks. On the contrary, inflation and real GDP growth rate are statistically insignificant.

Berger and Bouwman (2013) empirically estimate the impact of capital on banks' performance during financial crises and normal times in the US over the past quarter-century. This study finds out two results affecting the bank performance: firstly, capital helps the small bank enhance their profitability of survival and market share at all times. Secondly, this study finds that capital increases the performance of medium and large in the period of banking crises.

Kassem and Sakr (2018) explore the dynamic relationship between bank-specific factors and banks' profitability in Egypt. OLS regression analysis is employed to investigate the relationship between internal factors and profitability for a sample of 19 Egyptian commercial banks over the period 2007-2016. Results show that bank size and loan loss provision has a positive and significant

relationship with all measure of profitability. On the other hand, the capital ratio indicates a significant relationship with ROA and NIM, insignificant with ROE. Finally, the evidence also shows that the other two internal factors, loan and deposit ratios, have no significant impact on profitability.

Kiganda (2014) attempts to provide the effect of macroeconomic factors on bank profitability of commercial banks operating in Kenya with equity bank limited in focus respectively using annual data for five years spanning from 2008 to 2012. Using the ordinary least square method (OLS), this study suggests that macroeconomic variables negatively affect bank profitability at a 5% level of significance. However, bank-specific variables related to this study have a positive and significant effect on bank profitability in Kenya.

Adeusi et al. (2014) examine the factor affecting the profitability of commercial banks' profitability in the Nigerian banking industry using panel regression analysis for 14 commercial banks spanning from 2000 to 2013. The results of fixed and random effects estimations indicate that asset quality, management efficiency, and economic growth are statistically significant on profitability. Results also show that asset quality is more significant on profitability in all models, and credit risk is a significant determinant of commercial banks' profitability.

Acaravci and Calim (2013) assess the relationship between the bank-specific and macroeconomic factors and the profitability of commercial banks in the Turkish banking sector over the period from 1998 to 2011. Results reveal that macroeconomic variables bear a less significant impact compared to bank-specific variables. However, the actual domestic product and real exchange rate are positive and statistically significant on profitability.

Islam et al. (2017) investigate the determinants of profitability employing annual data for all the second-generation 22 private commercial banks of Bangladesh for 2014-2015. The study applies multiple regression analyses to examine the significant determinants of profitability and to test the hypothesis. The author shows that asset size and net interest margin (NIM) have no significant effect on profitability, but non-performing loans to total loans have the most significant impact on banks' profitability. Moreover, investment activities have a positive impact on return on equity (ROE). Results suggest that diversified banking activities, including commercial banks' investment activities, help achieve more profitability.

Alper and Anber (2011) point out the bank-specific and macroeconomic determinants of the bank profitability in Turkey covering the period from 2002 to 2010. The study includes ten commercial banks as a sample size consisting of 90

observations. Results from empirical analysis indicate that asset size and non-interest income positively and significantly impact bank profitability. Conversely, the size of credit portfolio and loans under follow-up negatively impact banks profitability. Among the macroeconomic variables, only real interest rate positively relates to the performance of banks profitability.

Sayllgan and Yildirim (2009) assess the impact of determinants of return on assets (ROA) and return on equity (ROE) for a sample of Turkish banks during the period from 2002 to 2007 using monthly data. Using the multi-variable single equation regression method, results of the empirical study show that the banking sector's profitability seems to have increased along with declining inflation rate, consistently increasing industrial production index and improving budget balance. The results also show that profitability is positively related to capital adequacy in broad terms and negatively by growing off-balance sheet assets.

Bourke (1989) evaluates the concentration and other determinants of bank profitability in twelve countries in Europe, North America, and Australia. Data to estimate the determinants of profitability is based on the financial statements of 90 banks in the ten years from 1972 to 1981. In this research, the term 'value added' is introduced to remove the difficulties in comparing banks in different countries. However, results agree with concentration and bank profitability studies for the domestic U.S. market and support is found for the Edwards-Heggstad-Mingo hypothesis. No support is found for expense preference expenditure theories.

Sufian and Habibulla (2009) examine the performance of 37 commercial banks of Bangladesh during 1997 and 2004. The experimental outcomes from regression analysis have shown that bank-specific characteristics, in particular loans intensity, credit risk, and cost, have positive and significant impacts on bank performance, but non-interest income exhibits negative impacts on bank profitability. Moreover, results have also shown that the size of the bank has a negative impact on return on average equity (ROAE) and a positive impact on return on average assets (ROAA) and net interest margins (NIM). The study includes some macroeconomic variables that have no significant impact on bank profitability, but inflation negatively impacts banks profitability.

Athanasoglou et al. (2008) seek to investigate the effect of bank-specific, industry-specific and macroeconomic factors incorporating the traditional structure- conduct-performance (SCP) hypothesis. A panel data set taken from Greek banks between 1985 and 2001 is evaluated using a generalised moments (GMM) technique. Findings suggest that factor influencing profitability in Greek banks is persisting to a moderate extent which explains that deviations from perfectly competitive market structures may not be significant. They also reveal

that all bank-specific variables significantly impact bank size, while the business cycle is positively related to Greek bank profitability.

Molyneux and Thorton (1992) state a relationship between determinants of bank profitability and profit influencing indicators using panel data on a set of countries. The study considers a sample of 18 European countries from 1986-1989. The empirical research results exhibit a significant positive relationship between the return on equity (ROE) and the level of interest rates in each country, bank concentration, and government ownership.

Ramadan et al. (2011) explore the characteristics of internal and external factors that influence the profitability of Jordanian banks concerning a balanced panel data set. Results reveal that the relationship between macroeconomic determinants, inflation and economic growth and bank performance has an insignificant positive impact on return on assets (ROA), but some of the differential slope coefficients are statistically significant.

Petria et al. (2015) estimate the bank-specific, industry-specific, and macroeconomic factors of the bank's profitability in EU27 from 2004 to 2011. Findings reveal that management efficiency, Credit and liquidity risk, the diversification of business, the market concentration/competition, and the economic growth affect the bank profitability on ROAA and ROAE while competition positively impacts bank profitability.

The earlier literature bears some weaknesses that need to be considered to conduct our research to clarify the concepts and econometric methods. From the survey of the existing researches, it is observed that there are much relevant profitability influencing factors that are absent in their research work. So, this study attempts to fill this gap considering the appropriate variables and factors.

3. Data, Variables and Empirical Econometric Methods

3.1 Data

To analyse the determinants of profitability, secondary panel data are collected from annual reports of commercial banks in Bangladesh for ten years from 2009 to 2018. The study involves 12 commercial banks of Bangladesh due to the unavailability of data from other banks. However, our sample consists of balanced data set accomplishing 120 total observations. Data of macroeconomic variables are retrieved from World Data Indicators.

3.2 Variables

To evaluate the determinants of profitability, eleven variables are included. Among these variables, return on assets (ROA) is used as a dependent variable,

and the rest of the variables are used as explanatory variables. The explanatory variables are categorised into internal and external variables.

Dependent Variables: This study investigates the profitability of commercial banks in Bangladesh using a measure of profitability which are proxied as return on assets (ROA). Return on assets (ROA) is defined as the net profit after tax to total assets. Naceur and Goaied (2008), Kosmidou (2008), and Flamini et al. (2009) use the return on assets as a dependent variable in their research. It shows the profit per taka of assets and signals how effectively the bank's assets are being managed by an authority to generate revenues. The ROA is utilised to evaluate the competence and operational performance of the bank as it examines the profits generated from the assets invested by the bank (Jahan, 2012 and Golin, 2001).

Independent Variables: Several empirical evidence reveals that financial institutions' profitability, specific banks, are affected by internal and external factors. The internal determinants include bank-specific variables, and the external factors reflect macroeconomic variables that are expected to affect banks' profitability.

Bank-Specific Variables: The internal factors are also known as bank-specific factors that are related to internal efficiency and managerial decisions. Some internal factors are selected in this study based on previous literature.

Bank Size: The bank size is measured as the natural logarithms of total assets (Size). It is the essential determinants of profitability of commercial banks. According to Flamini et al. (2009), the bigger the size of the banks, the lesser the requirement for profits, whereby lower interest rates are charged to borrowers. Rahman et al. (2015) and Alper and Anbar (2011) have found a significant positive impact on profitability. Conversely, bank size has a significant negative impact on profitability (Syafri, 2012).

Capital Adequacy: Capital adequacy is defined as the ratio of shareholder's equity to total assets. The factor discusses the ability of a bank to withstand the unanticipated losses in this study. This ratio investigates the linkage with the financial soundness of the bank between profitability and bank capitalisation. It is expected that the banks associated with well-capitalised have high profitability (Demirguc-Kunt and Huizinga, 1999; Berger, 1995 and Bourke, 1989). In other words, a high capital asset ratio is assumed to be an indicator of low leverage and, therefore, lower risk. Conversely, banks with lower capital adequacy are considered riskier relative to highly capitalised banks.

Liquidity: Liquidity is the ratio of total loans divided by the total deposit of banks. According to (Ongore and Kusa, 2014), liquidity is the bank's ability to meet its obligations, mainly those of depositors of funds. It is the ability of a firm,

company, or even an individual to pay its debts without suffering catastrophic losses. Investors, managers, and creditors use liquidity measurement ratios when deciding the level of risk within an organisation. If an individual investor, business, or financial institution cannot meet its short-term debt obligations, it is experiencing liquidity. Studies of (Molyneux and Thornton, 1992 and Guru, 2002) state that profitability and liquidity have had a significant negative relationship.

Deposit: The deposit of a bank is measured by deposit divided by total assets. Deposit is the liability for a bank that is the primary source of collecting funds for banks. Generally, any bank of a country can raise the loan scope to customers by raising banks' deposits. As a result, the rising loan can create more profit in future. In addition, there is a positive linkage between deposit and profitability (Lee and Hsieh, 2013). More deposits of a bank can generate more profits, and lower deposits can generate lower profits.

Operating Efficiency: Operating efficiency is computed as the ratio of total operating cost to total operating income of banks. It indicates the management's ability to control costs. If the efficiency ratio increases, a bank's expenses are increasing, or its revenues are decreasing. Banks that focus more on cost control will naturally have a higher efficiency ratio, but they may also have lower profit margins. Some literature review indicates that low operating costs lead to greater profitability of commercial banks. Heffernan and Fu (2008) take the cost to income ratio as the operational efficiency ratio and show a negative relationship with profitability.

Non-Traditional Activities: Off-balance sheet activities to total assets is considered non-traditional activities (OFBSTA). It is also another critical determinant of bank profitability. Off-balance sheet activities may improve earnings ratios because earnings generated from the activities are included in the income numerator, while the balance of total assets included in the denominator remains unchanged. So this ratio is included in the regression equation that measures profitability to capture off-balance activities. Finally, off-balance-sheet activities help increase their income source without changing capital structure (Deelchand and Padgett, 2009).

Macroeconomic Variables

Like bank-specific factors, macroeconomic factors also affect bank profitability, which this study chooses based on a previous literature review. Several researchers have used GDP as a macroeconomic factor and a standard measure to measure the aggregate economic activity within an economy (Francis, 2013; Pasiouras and Kosmidou, 2007). The study conducted by Anbar and Alper (2011) has used the inflation rate.

GDP Growth Rate: The growth rate of gross domestic product (GDPG) is used to measure the macroeconomic conditions calculated as the annual change of the GDP. It measures the growth rate of the economy. It is the most commonly used macroeconomic indicator in the literature of bank profitability of commercial banks. A significant positive relationship is expected between the profitability of the banks and this variable based on the findings of Durajet al. (2015). According to the literature on the association between economic growth and financial sector profitability, GDP growth positively affects bank profitability (Demirguc-Kunt and Huizinga, 1999).

Inflation Rate: The inflation rate is used in this model to proxy the impact of inflation on profitability. Earlier literature shows that the impact of inflation on profitability depends on whether the inflation is anticipated or unanticipated. If inflation is fully anticipated, the interest rates are adjusted accordingly, resulting in increased revenues of banks and a positive impact on profitability. However, if inflation is unanticipated, the banks may be slow in adjusting their interest rates, resulting in a faster increase of banks costs that negatively impact bank profitability and vice-versa. The study conducted by Molyneux and Thornton (1992) and Bourke (1989) shows a positive relationship between inflation and bank profitability. Table 1 lists the measurements of different variables, notations and their Expected sign.

Table 1: Measurement of the Variables and their Expected Sign

Types	Variables	Measurement	Notation	Expected sign
Dependent variables	Return on assets	Net profit after tax/total assets	ROA	NA
	Bank size	Natural logarithm of total assets	SIZE	+/-
Internal variables	Capital adequacy	Equity/ total assets	CAD	+
	Deposit	Deposits/total assets	DP	+
	Liquidity	Total loans/Deposit	LQD	+/-
	Operating efficiency	Operating cost/operating income	OEF	+/-
External Variables	Non-traditional activities	Total of off-balance-sheet activities/total assets	OFBST A	+
	Economic activity	GDP growth rate	GDPG	+
	Inflation rate	Annual inflation rate	INF	+/-

3.4 Empirical Econometric Methods

The purpose of this study is to estimate the determinants of profitability of commercial banks in Bangladesh. We applied the methodologies are fixed effects (FE) or random effects (RE) methods and generalised methods of moments (GMM). In order to choose the suitable econometric model (i.e., either fixed effect or random effect), the Hausman specification test is carried out. It means that the Hausman test decides which model is more appropriate. The generalised method of moments (GMM) is used by Berger et al. (2000), Goddard et al. (2004) and Athanasoglou et al. (2008).

The basic framework for the panel data is defined as per the following regression model (Brooks, 2014). The model consists of i cross-sectional units in the panel data, denoted by $i = 1, \dots, N$, observed at each of t time periods, $t = 1, \dots, T$. In data set, the total observations are $i \times t$.

$$Y_t = \alpha + \beta X_t + \varepsilon_t \quad (1)$$

Where Y_{it} denotes the profitability indicator, α is referred to as intercept term, β is a $k \times 1$ vector of the parameter to be estimated, and vector of observations is X_{it} , ($t = 1, \dots, T$, $i = 1, \dots, N$) and ε_{it} denotes the error term.

In this study, the functional form of variables is specified as:

$$\text{Profitability} = f(\text{Bank-specific variables, Macroeconomic variables}) \quad (2)$$

Where ROA measures profitability, the bank-specific variables are bank size, capital adequacy, liquidity, deposit, operating efficiency and non-traditional activities and macroeconomic variables include GDP growth rate and inflation rate.

Panel data models are estimated using either fixed-effects or random-effects models. Fixed effect models describe that the individual-specific effect is a random variable that can be correlated with the explanatory variables. The rationale behind the random effect model is that, unlike the fixed effects model, the individual-specific effect is a random effect variable uncorrelated with the independent variables. Further, the Hausman test is conducted to decide the appropriate model between fixed and random effect models.

In panel data analysis, fixed effect or random effect models are usually applied. However, it is argued that the persistence of bank profitability over time can affect next year's profit (Athanasoglou et al., 2008). As a result, a difficulty arises with these models when a lagged dependent variable is concerned,

particularly in very few periods and many observations. To mention this issue, Arellano and Bond (1991) develop the difference of generalised method of moments (GMM) model by differencing all repressors. It is a single left-hand-side variable that is dynamic depending on its own past realisations.

Arellano and Bover (1995) and Blundell and Bond (1998) argue that the GMM difference estimator is inefficient if the instruments are weak. Hence, they developed a new method called GMM system estimator and includes lagged levels and lagged differences. The system GMM estimator assumes that the first differences of instrumental variables are uncorrelated with the fixed effects. It also argues that both difference and system GMM estimators are suitable for situations with "small T, large N" panels. The specification for GMM proposed by Athanasoglou et al. (2008) is used to conduct the empirical analysis:

$$Y_{it} = C + \delta Y_{i,t-1} + \sum_{j=1}^J \beta_j X_{it}^j + \sum_{m=1}^m \beta_m X_{it}^m + \varepsilon_{it} \quad (3)$$

Where,

$$\sum_{j=1}^J \beta_j X_{it}^j = \beta_1 SIZE_{it} + \beta_2 CAD_{it} + \beta_3 LQD_{it} + \beta_4 DP_{it} + \beta_5 OEF_{it} + \beta_6 OFBSTA_{it} \quad (4)$$

$$\sum_{m=1}^m \beta_m X_{it}^m = \beta_1 GDPG_{it} + \beta_2 INF_{it} \quad (5)$$

Where, Y_{it} is the probability indicator proxied by ROA of bank i at time t , where $i = 1, \dots, N$, $t = 1, \dots, T$. C is the constant term. $Y_{i,t-1}$ denotes the one-period lagged value of the dependent variable, the speed of adjustment to equilibrium. A value between 0 and 1 implies that profit persists, but eventually returns to its normal level. A δ value close to 0 means that the industry is pretty competitive (high speed of adjustment), while a value δ close to 1 implies a less competitive structure (very low adjustment). X_{it} is the explanatory variables and ε_{it} the disturbance term, i.e. $\varepsilon_{it} = v_{it} + u_{it}$, with v_{it} the unobserved bank-specific effect and with idiosyncratic error. It is a one-way component regression model, where $v_{it} \sim \text{IIN}(0, \sigma_v^2)$ and independent of $u_{it} \sim (0, \sigma_u^2)$. The X_{it} is grouped into bank-specific X_{jit} and macroeconomic variable X_{mit} . Bank-specific variables are bank size, capital adequacy, liquidity, deposit, operating efficiency and non-traditional activities. On the other hand, macroeconomic variables considered are GDP growth rate and inflation rate.

4. Results and Discussions

This section provides descriptive statistics of variables, the correlation matrix of explanatory variables, random effect regression results and GMM regression results.

4.1 Descriptive Statistics of Variables

This section presents the descriptive statistics for the dependent and independent variables in the regression model mentioned in the methodology. The basic descriptive statistics of all variables utilised are presented in Table 2. Table 2 shows the total observation, mean, standard deviation, maximum and minimum value for each variable.

Table 2: Descriptive Statistics of Variables

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
ROA	120	0.009	0.013	-0.073	0.042
SIZE	120	25.999	0.664	24.534	27.487
CAD	120	0.07	0.037	-0.134	0.147
LQD	120	0.906	0.539	0.538	6.612
DP	120	0.797	0.057	0.624	.91
OEF	120	0.627	1.56	0.235	17.444
OFBSTA	120	0.304	0.133	0.013	.597
GDPG	120	5.255	1.274	2.416	7.864
INF	120	6.259	2.301	2.007	11.395

From Table 2, the mean value of profitability measure like return on assets (ROA) is 0.009. The maximum value for ROA is 0.042, whereas the minimum value is -0.073. The standard deviation of ROA is 0.013. In the case of profitability influencing internal factors, bank size is the factor of profitability, the natural logarithm of total assets. The mean value of bank size is 25.99 and the standard deviation of 0.664, which implies that the maximum and minimum values are 27.487 and 24.534, respectively. The mean value of capital adequacy (CAD) is 0.07, whereas the maximum value is 0.147, with a negative minimum of -0.134. The standard deviation for CAD is shown by 0.037. Liquidity (LQD) is the critical factor of profitability, implying that the average value is 0.906 and the standard deviation of 0.539. The maximum and minimum values of liquidity are indicated by 6.612 and 0.538. The mean deposit (DP) value is 0.797, whereas the maximum value is 0.91 and the minimum value is 0.624. The average value of

operating efficiency represented by OEF is 0.627 with a standard deviation of 1.56, whereas the maximum and minimum values of OEF are 17.44 and 0.235, respectively. The off-balance sheet activities to total assets (OFBSTA) have a mean value of 0.304 and a standard deviation of 0.133 with a maximum value of 0.597 and a minimum value of 0.013. In the case of profitability influencing external factors, the average values of GDP growth rate represented by GDPG and inflation represented by INF are 5.255 and 6.259, respectively. Finally, the maximum value of GDPG is 7.864 with a minimum value of 2.416, and the maximum inflation is indicated by 11.395 with a minimum value of 2.007.

4.2 Correlations Analysis of Explanatory Variables

Table 3 presents the correlation coefficient between the explanatory variables used in the regression models. The overall eight explanatory variables are used in this study which is bank size, capital adequacy (CAD), liquidity (LQD), deposit (DP), operating efficiency (OEF), non-traditional activities (OFBSTA), GDP growth rate (GDPG) and inflation (INF). There is no multicollinearity problem in this correlation matrix because of the low degree of the correlation coefficient between explanatory variables. In Table 3, the correlation between explanatory variables is shown:

Table 3: Correlation Matrix of Explanatory Variables

Variables	SIZE	CAD	LQD	DP	OEF	OFBSTA	GDPG	INF
SIZE	1.000							
CAD	-0.167	1.000						
LQD	0.014	-0.088	1.000					
DP	-0.149	-0.157	-0.126	1.000				
OEF	0.026	-0.569	-0.011	-0.070	1.000			
OFBSTA	-0.183	0.568	0.056	-0.307	-0.215	1.000		
GDPG	-0.225	-0.065	0.075	0.128	0.065	-0.020	1.000	
INF	-0.150	0.011	-0.008	0.160	0.048	0.011	0.164	1.00

Table 3 shows that the highest correlation coefficient is between off-balance sheet activities (OFBSTA) and capital adequacy (CAD), with a magnitude of 0.568. The correlation matrix implies no multicollinearity problem among the explanatory variables, and hence the study results are efficient. According to Gujarati (2002), the multicollinearity problem can be considered if the pair-wise correlation coefficient between two regressions is more than 0.8. Finally, since all independent variables have a correlation coefficient with a lower value than 0.8, there is no multicollinearity phenomenon.

4.3 Hausman Specification Test

Many studies have used the fixed-effect method (FEM) and random effect method (REM) to estimate the determinants of profitability of commercial banks. However, both methods are not appropriate to estimate the result of the study. To determine which model is more appropriate, we can run the Hausman test developed by Hausman (1978). Table 4 depicts the Hausman test results that fit the model:

Table 4: Hausman Specification Test

Hausman test ROA	Prob>chi2 0.510
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Table 4 shows that for three different dependent variables, there are three models, and they display the P-values by Hausman test, which suggests that if the null hypothesis is accepted at a 5% significant level that indicated by P-value, then the fixed-effect method may be more appropriate to be used compared to the random effect method. However, if the alternative hypothesis is rejected at more than 5% significance levels, the random effect model is more suitable. Since the p-value for the three models is 0.510, 0.348 and 0.331, which are excess of 5% levels of significance in this study, the random effects model is an efficient estimator of the data compared to the fixed effect model. Hence, the study adopts the random-effects model.

4.4 Random Effect Regression Results and Discussions

This section presents the random effect regression analysis results on the determinant factors of commercial banks profitability in Bangladesh. From the

Table 5: Relationships between Explanatory Variables and ROA

Variables	Coefficient	t-value	p-value
SIZE	-0.005***	-3.87	0.00
CAD	0.236***	8.05	0.00
LQD	-0.007***	-5.27	0.00
DP	0.056***	3.96	0.00
OEF	0.002***	3.00	0.00
OFBSTA	0.016**	2.23	0.02
GDPG	-0.001**	-2.17	0.03
INF	0.000	-0.97	0.334
CONSTANT	0.074**	2.06	0.03
Model Summary			
Overall R ²	0.680	Number of obs	120.
R ² within	0.583	Wald χ^2	235.
R ² between	0.886	Prob> χ^2	0.00

Note: ***, ** and * indicate the significance at 1%, 5% and 10% levels respectively.

Hausman specification tests carried out, the Random effect model has been pointed as the most efficient model to be applied by the study. The Random effect method is run to determine the determinants that affect the profitability measurement of ROA. The factors determinants are identified by bank size (SIZE), capital adequacy (CAD), liquidity (LQD), deposit (DP), operating efficiency (OEF) and non-traditional activities (OFBSTA). The regression results using this method are presented as follows.

As shown in Table 5, the overall R² of 0.683 indicates that the included explanatory variables explain about 68.3 % variation in dependent in the banking sector and the remaining 31.7 % variation is due to unobserved variables or error terms. The Wald χ^2 statistic of 235.718 shows that the model is correctly specified and that the null hypothesis of variable inclusion is rejected at the 1% level of significance.

Table 5 shows that the coefficient value of bank size and liquidity is a negative and statistically highly significant determinant of profitability for the ROA model at a 1% significance level. This negative result of bank size is consistent with the finding of Athanasoglou et al. (2005). Molyneux and Thornton (1992) and Pasiouras and Kosmidou (2007) find a significant and negative relationship between liquidity and profitability. There is a positive and highly significant relationship between capital adequacy, deposit and operating efficiency and profitability measurement of ROA at a 1% significance level. This positive empirical result of capital adequacy is consistent with Pasiouras and Kosmidou (2007) studies and Demircuc-kunt and Huizinga (1999). The non-traditional activities are regarded as off-balance sheet activities to total assets, with a positive coefficient of 0.016 and statistically significant at the 5% level of significance.

4.4 GMM Regression Results and Discussions

Return on assets has been considered to determine the profitability factors of commercial banks in Bangladesh using generalised system methods of the moment (GMM), which are described as follows. To verify the result from the random effect model and control effects of heterogeneity within and between panel groups, this study also conducts the generalised methods of the moment (GMM). The system GMM tries to deal with weak instrument problem by augmenting instruments. Furthermore, over-identification is tested using Sargan's test.

From Table 6, the model seems to fit the panel data reasonably well, having pretty stable coefficients, while the Wald χ^2 is 206.731 at 1% significance level, indicating goodness of fit, and the Sargan-test value (84.05847) shows that there is no evidence of over-identifying restrictions.

Table 6 shows that capital adequacy (CAD), operating efficiency (OEF) and non-traditional activities have a positive and highly significant impact on the profitability of commercial banks in Bangladesh at a 1% level of significance. The finding of the positive coefficient is consistent with previous studies of Masood and Ashraf (2012), indicating that banks with sound capital positions located in Bangladesh face lower costs, which also suggests reduced cost of funding or lower need for external funding, implying higher profitability. There is a positive and significant relationship between deposit and bank profitability at a 5% significance level. The deposit of commercial banks is the main sources of funding. The deposits are transformed into loans and it raises the bank profitability. The coefficient of 0.064 indicates that 1% increases in deposit increase the 6.4% return on assets. It means that an increase in deposit leads to an increase in profitability measure of ROA. Referring to the impact of liquidity, negative and highly significant impact on the profitability of commercial banks is found 1% significant level. The negative coefficient implies that an increase (decrease) in liquidity reduces (increases) the profits of commercial banks.

5. Conclusions

The banking sector contributes to economic growth in general, and primarily commercial banks of Bangladesh are regarded as the essential sources of funding. This study aims to determine the factors that influence the profitability of commercial banks in Bangladesh and to estimate the significant factors using panel data from 12 commercial banks in Bangladesh and applying econometric panel methods, random-effects model and generalised methods of moments. Moreover, this study focuses on the bank-specific and macroeconomic factors that act as determinants of profitability. Random effect regression results report that bank size, liquidity, and GDP growth rate negatively impact profitability. Capital adequacy, deposit, operating efficiency and non-traditional activities are positively and significantly related to profitability. Generalised methods of moments suggest a positive and significant relationship between capital adequacy, deposit, non-traditional activities and bank profitability measurement of ROA. Liquidity has a significant negative effect on profitability. The policy implication from the findings of this study suggests that bank size, capital adequacy, deposit, liquidity and non-traditional activities are critical factors for ensuring sustainable operations of commercial banks and contributing to the national economy as a whole. It recommends that a large bank size may not necessarily be able to earn higher profits. Instead, small size banks and their efficient utilisation may lead to higher profit. This study further shows that well-capitalised banks ensure financial

stability and make the industry more resilient against external shocks and risk. So, the management should concentrate on ensuring better capital management to increase the profits of banks. This finding indicates that those banks holding higher liquid assets are likely to have reduced profitability. It is also recommended that management concentrate on increasing their deposit for higher profitability and sustainability in the long run. The more deposits are transferred into the loan, the more profitability of commercial banks in Bangladesh.

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A Feasibility Study to introduce Town Bus Service in Rajshahi City Corporation Area

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Abstract

This article deals with the Rajshahi City Corporation (RCC) issue- the absence of Town Bus service in the RCC area. It also examines the feasibility of introducing the Town Bus service in the same area. The First Two sections of the paper are devoted to explaining the justification, objectives and methodology. The following two sections are devoted to analysing data and the feasibility of introducing town bus services in RCC. In the last and concluding section, the authors have recommended some policy options to consider the RCC authorities concerned.

JEL Classification R41 · R42 · R52

Keywords Feasibility Study · Town Bus Service · City Corporation, Rajshahi (Bangladesh)

Introduction and objective

Transportation has been considered one of the essential components of human civilisation and development from the early stages of human settlement. At present, transportation is also an issue of great concern for the increased population of a country, and an efficient transport system is a prerequisite for the economic development of a country. However, the people of Bangladesh spend a significant part of their time and money on transport. Significantly, the inadequate

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public transport system in most of the cities in Bangladesh cannot meet the travel demand of the city dwellers. Rajshahi City Corporation is one of them. Among 12 city corporations in Bangladesh, Rajshahi is one of the oldest city corporations established on 11 September 1988(RCC). The area of Rajshahi City Corporation is 2407.01 square kilometres. The present population of Rajshahi city is about 763,952 (RCC). Despite being an ancient city corporation, actual public transport, as we mean, is yet to develop here.

Town service is almost absent in the area. The leading cause is the presence of about 30-35 buses of Rajshahi University running in the city. Besides, some government and semi-government organisations, including Rajshahi College, RUET and Rajshahi Medical College buses running in the city to serve their purposes that deprive the ordinary residents of Rajshahi City Corporation. Therefore, a public transport system should be introduced in Rajshahi city to fulfil the transport needs of the city's inhabitants.

Before 2008, the man-pulled rickshaw was the primary vehicle for short distant transportation. However, after 2008, battery-driven auto-rickshaw has emerged as the main transport means in the Rajshahi City Corporation. Now it is the most popular transport means. According to a private survey, there are nearly 15,000 battery-run auto-rickshaws, 35,000 rickshaws, 800 CNG-run auto-rickshaws, 1,500 human hauliers, 1,200 rickshaw vans and 1,500 cars and minibuses in Rajshahi City (the independent 2015). According to the RCC (2016), 9,998 auto-rickshaws and 22,561 rickshaws are running in the city area.

Everyday several thousands of battery-driven unauthorised auto-rickshaws are plying on the main streets in the city, creating extreme traffic jams and sometimes deadly accidents. Many passengers of the auto-rickshaws said that, accidents and traffic jams are increasing on the streets due to plying of the auto-rickshaws by inefficient drivers. Most of the people, who earlier used to pull rickshaws and vans, are now driving the battery run auto-rickshaws without any training. They do not follow traffic rules and regulations. Even many of them do not have necessary papers like the license of the vehicle and driving. As a result, accidents occur every day. For this reason, to remove traffic jams, reduce accidents and travel faster at low cost, it has become essential to introduce town service in Rajshahi City Corporation.

The broad objective of this study is to examine the feasibility of introducing the Town Bus Service in the RCC area. Within this broad objective, the following sub-objectives have been determined.

- a. To examine the conditions of the existing transport system in RCC.
- b. To conduct a complete survey on the present transport vehicles plying within the RCC area.

- c. To identify the problems of transportation in RCC.
- d. To make recommendations for removing those problems and introducing town services in RCC like others city corporations.

Limitations of the Study

Town bus services in Rajshahi City Corporation is a new and essential concept. There are some limitations of the study:

- i. The researchers have faced difficulty with finding the present published papers and data about town services in Bangladesh. There are not enough research documents, updated data, or statistical records about RCC city bus services in any government source or website.
- ii. We have failed to collect profit and loss of corresponding bus departments because they refused to give this information. Therefore, we may assume that they are losing concerns.

These limitations should be kept in mind while evaluating the results and implications of the study.

METHODOLOGY

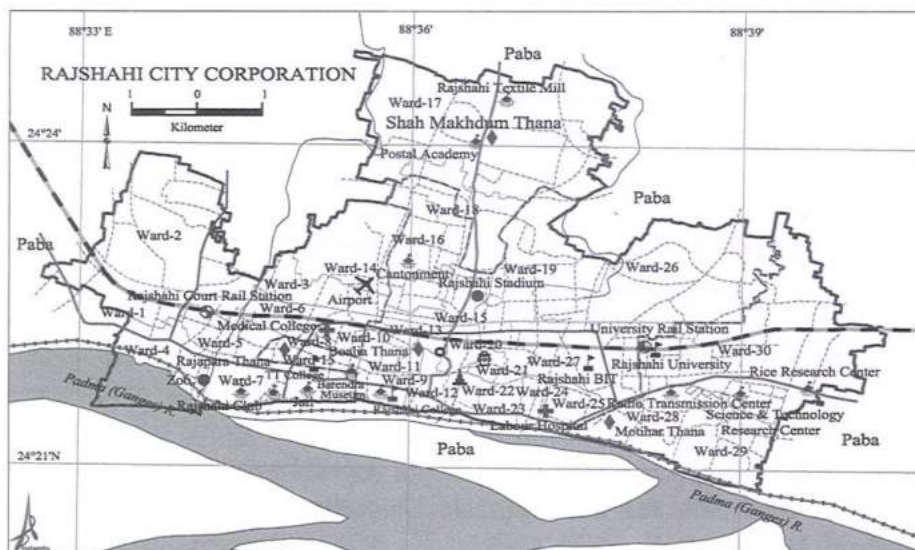
In preparing this paper, we have used both primary and secondary data. Secondary data have been collected from Rajshahi University, RUET, Rajshahi College, Rajshahi Medical College, RCC, RDA, and BBS. Primary data have been collected through a field survey. We have used statistical methods in the data processing. Besides these, we have taken the help of different publications on transportation systems by different Authors.

Selection of Study Area

The selected area of the study is Rajshahi City Corporations (RCC) in Bangladesh. Rajshahi City Corporation (RCC) is one of the major divisional City corporations among 12 City Corporations in Bangladesh. Rajshahi City Corporation (RCC) is located in between 24°20" and 24°24" north latitudes and between 88°32" and 88°40" east longitudes. It got the status of City Corporation on 11 September 1988 (RCC). Before its establishment as City Corporation, it was a municipality from 1876. According to the 2001 and 2011 census, the population of Rajshahi City Corporation was 388,811 and 763,952 (RCC), respectively. From 2011 to 2016, there have been substantial changes in population size caused by the changes in national, regional, socio-economic and political conditions. Therefore, we see the population of Rajshahi city has doubled in a decade. Accordingly, the population may be about 1.5 million and 3 million

in 2021 and 2031, respectively. The density per square kilometre of the population is 4318 (BSS, 2012: Population and Housing Census 2011). So, it is high time to formulate plans of introducing town service to remove public sufferings. Figure 1.1 shows the map of Rajshahi City Corporation.

Figure 1.1. Map of RCC



Selection of Sample

The present study is conducted in RCC. There are four thanas in Rajshahi City Corporation. The study area lies in four thanas: Boalia, Rajpara, Shah Makhdum and Motihar, which includes 30 wards. For collecting data, a multistage random sampling technique was used in the study. We collected 240 samples. 120 among 240 samples were collected from city dwellers, 60 samples were collected from rickshaw pullers, and 60 samples were collected from auto-rickshaw drivers. We selected different crucial points of RCC such as Binodpur, Kazla, Rajshahi Zero Point, C&B, Court, Kasiadanga, Rajshahi Court Station, Bornali Mor, Rajshahi Railway Station, Vodra More, Nowdapara, Baneshwar for collecting data from rickshaw pullers and auto-rickshaw drivers. We also collected data from city dwellers about starting city bus services randomly from 30 wards.

Collection of Data

Data have been collected from both primary and secondary sources to meet the objectives of the study. All necessary data were not available in secondary

sources. Moreover, some were too backdated to use here. Therefore, we had to collect primary data to fulfil the objective of the study.

Primary data

Following the conventional survey technique, primary data on present transport condition of Rajshahi City Corporation (RCC), dwellers opinions about city bus services, opinions of rickshaw pullers and auto-rickshaw drivers about their occupations and town bus services and some other relevant information were collected by face-to-face interview using a pre-tested and structured questionnaire.

Secondary Data

In addition to collecting data from primary sources, secondary sources have also been used to fulfil the objectives of the study. These secondary data have been collected from various local and international publications. Secondary data have been collected from Rajshahi University, RUET, Rajshahi College, Rajshahi Medical College, Rajshahi City Corporation (RCC), Rajshahi Development Authority (RDA), and Bangladesh Bureau of Statistics (BBS), Publications of IBS (University of Rajshahi) journal and research works, Economic Reviews. The publications and planning documents of various departments, divisions, and ministries have also been used as secondary data sources. Moreover, different local and international websites were also visited to collect the specific data.

DATA ANALYSIS

Primary Data Analysis

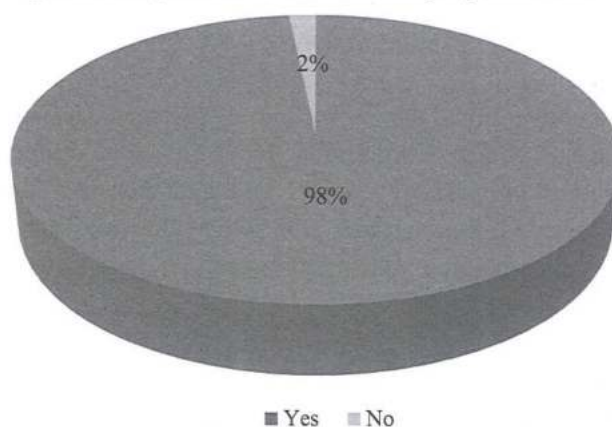
Opinion of City dwellers about starting City Bus service in RCC

Rajshahi City Corporation has 30 wards under four police stations. We selected fifteen (15) among the thirty (30) wards. A total of 120 respondents (08 respondents from each wards) were asked to introduce City Bus Service in RCC. Among the respondents, 118 or 98.30% gave a positive opinion, while only 02 or 1.7% opined negatively. 1.7% of respondents believe that the roads of RCC are not spacious enough for bus service. However, after good years of road development, it should be introduced. Figure 1.2 shows the opinion of Rajshahi city dwellers about introducing city bus service.

Occupation-wise Distribution of People Interviewed

A variety of people live in Rajshahi City Corporation. To determine the necessity of town bus services, data have been collected from different people. In total 10 groups were selected including Doctors (6.7%), Reporters (4.2%),

Opinion of City Dwellers about introducing city bus service



Bankers (10%), Teachers (9.2%), Housewives (8.3%), Service holders (9.2%), Businessmen (16.7%), Students (23.3%), Workers (8.3%), and Unemployed (4.2). It has been shown in table - 4.1.

Table 5.1: Occupation-wise distribution of people interviewed

Occupation of RCC Dwellers	Share, %
1. Doctor	6.7
2.	
3.	
4. Reporter	4.2
5. Banker	10.0
6. Teacher	9.2
7. Housewife	8.3
8. Service Holder	9.2
9. Businessman	16.7
10. Student	23.3
11. Worker	8.3
12. Unemployed	4.2
Total	100.00

Source: Authors' Calculation, Sample Size - 120

Percentage comments of city residents

To study the feasibility of introducing town bus services in RCC, a survey was conducted among the ordinary people of the City Corporation area. Different people opined differently (Table-4.2). Among them 22% think that town bus services are a safe transport system, 59% believe that city bus services will reduce

the travel time and cost of the people, 34.2% perceive that the main modes of transport of the city (Rickshaw and Auto-rickshaw) are precarious and costly, 9.8% guess that vehicles of educational institutions are very irregular and insufficient, 19.7 % people think that transport jams will be removed if city bus service is introduced and 0.9% provided other logics for introducing city bus services.

Table 4.2: Opinions of city residents interviewed

Opinions	%
1. Town bus service is a safe transport system	22.0
2. Town bus service reduces the travel time and cost	59.0
3. Rickshaw and Auto-rickshaw are risky and costly	34.2
4. Vehicles of educational institutions are irregular and insufficient	9.8
5. transport jam will be removed	19.7
6. Others	0.9
Total	100.0

Source: Authors' Calculation, Source: Sample size-120

Characteristics of Rickshaw Pullers and Auto-Rickshaw drivers

This section identifies and summarises the socio-demographic characteristics of rickshaw pullers and auto-rickshaw drivers interviewed in the study. It covers such background variables as age, marital status, education level, family size, and dependents. Understanding these selected background information is considered necessary for a greater understanding of the research questions addressed in this study.

Age of Auto-Rickshaw Drivers and Rickshaw Pullers

Figures presented in Table 4.3 show that the highest number of auto-rickshaw drivers lies in 31-40 (42.3%). The next highest lie in the age group 21-30 (32.7%). For age groups 41-50, 11-20, 51-60 and 61-70 the corresponding figures are (11.6%), (7.7%), (3.8%) and (7.9%) respectively. What is interesting is that there were no auto-rickshaw drivers in the age group 71-80.

Table 4.3 also shows that the highest number of Rickshaw pullers lie in the age group 31-40 (32%), and the next highest lie in the age group 21-30 (30%). For age group 41-50, 51-60 and 61-70, the corresponding figures are 28%, 6% and 2% respectively. Interestingly, there were nearly no rickshaw pullers in the age group 71-80 (only 2%).

Table 4.3: Distributions of auto-rickshaw drivers and rickshaw pullers according to age group

Age group		Share of Auto-rickshaw drivers, %	Share of Rickshaw pullers, %
1.	11 – 20	7.7	0.0
2.	21 – 30	32.7	30.0
3.	31 – 40	42.3	32.0
4.	41 – 50	11.6	28.0
5.	51 – 60	3.8	6.0
6.	61 – 70	1.9	2.0
7.	71 – 80	0.0	2.0
Total		100.0	100.0

Source: Authors' Calculation, Sample Size: 60 for auto-ricksha drivers and 60 for rickshaw pullers

Level of Education of Auto-rickshaw Drivers and Rickshaw Pullers

It is seen from Table 4.4 that the level of education of the rickshaw pullers and auto-rickshaw drivers were deficient in the study area. It was found that 36.5% of auto-rickshaw drivers and 56% of rickshaw pullers were illiterate or had the ability to signature only. About 23.1% of auto-rickshaw drivers completed PSC (Primary School Certificate) to SSC (Secondary School Certificate) level education, whereas only 14% of rickshaw pullers have this level of education. Therefore, it is seen from table 4.4 that auto-rickshaw drivers were more educated than rickshaw pullers.

Table 4.4: Distribution of auto-rickshaw drivers and rickshaw pullers according to the level of education

Level of education	Share of Auto-rickshaw drivers, %	Share of Rickshaw pullers, %
1. Up to PSC	13.5	26.0
2. From PSC to SSC	23.1	14.0
3. From SSC to HSC	15.4	4.0
4. BSS or more	11.5	0.0
5. Illiterate or Can Signature	36.5	56.0
Total	100.0	100.0

Source: Author's Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers

Family Members

Table 4.5 shows that most families are nuclear in the case of auto-rickshaw drivers and rickshaw pullers. At present, the joint family is breaking down with the change of social and economic conditions. Very few auto-rickshaw drivers and rickshaw pullers live in joint families. This study found that most auto-rickshaw drivers and rickshaw pullers have 3 or 4 members in their families.

Table 4.5: Distribution of auto-rickshaw drivers and rickshaw pullers according to family size

Family Size	Auto-rickshaw number	drivers,	Rickshaw number	drivers,
1. Mean	4.28		4.49	
1. Maximum	9		10	
2. Minimum	3		2	

Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers

Ownership of the Vehicles

The number of auto-rickshaws is increasing day by day, and rickshaws are decreasing within the RCC area. The prices of battery-driven rickshaws are higher than that of man pulled rickshaws. Due to this reason, most of the rickshaw pullers drives rickshaws on hired basis. In the case of auto-rickshaws, 67.3% of drivers have their own auto-rickshaws, and 32.7% use hired ones. Table 4.6 portrays the ownership of auto-rickshaws and rickshaws.

On the contrary, 48% of rickshaws were personal, and 52% were hired. Because of increasing demands and high incomes, the number of auto-rickshaws went up both personally and hired. Though, the cost of rickshaws is less than that of auto-rickshaws.

Table 4.6: Distribution of auto-rickshaws and rickshaws according to ownership

Type of Ownership	Auto-rickshaws, %	Rickshaws, %
1. Personal	67.3	48.0
2. Rented	32.7	52.0
Total	100.0	100.0

Source: Authors' Calculation, Sample Size: 60 for auto-rickshaws and 60 for rickshaws

Net Income of Rickshaw Pullers and Auto-rickshaw Drivers

Generally, the income level of auto-rickshaw drivers is high compared to rickshaw pullers, and for this reason, the living status of auto-rickshaw drivers is

comparatively better than rickshaw pullers. Figures presented in table 4.7 show that the monthly average net income of auto-rickshaw drivers and rickshaw pullers are Tk. 16,153.85 and Tk. 9,435 respectively. The maximum income of an auto-rickshaw driver is Tk. 27,000, which is two times higher than the income of a rickshaw puller. A rickshaw puller's minimum income is Tk. 4,500 per month, whereas the minimum income of an auto-rickshaw driver is Tk. 7,500.

Table 4.7: Net income of an auto-rickshaw driver and a rickshaw puller (in a month)

Type of Incomes		Net income of auto-rickshaw drivers	Net income of rickshaw pullers
1.	Mean	16,153.85	9,435
2.	Maximum	27,000	13,500
3.	Minimum	7,500	4,500

Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers

Marital Status of Rickshaw Pullers and Auto-rickshaw Drivers

Figures presented in table 4.8 show that almost all the rickshaw pullers and auto-rickshaw drivers interviewed are married. Ninety-eight percent of rickshaw pullers and 80.8 percent of auto-rickshaw drivers are married. Only 19.2 percent of auto-rickshaw drivers and 2% of rickshaw pullers are unmarried.

Table 4.8: Marital Status of rickshaw Pullers and Auto-rickshaw Drivers

Marital Status		Auto-rickshaw Drivers, %	Rickshaw Pullers, %
1.	Married	80.8	98.0
2.	Unmarried	19.2	2.0
Total		100.0	100.0

Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers

Land ownership of Rickshaw Pullers and Auto-rickshaw Drivers

As shown in table 4.9, around 75% of the Auto-rickshaw drivers and 92% of Rickshaw pullers have no land, and only 11.5% Auto-rickshaw drivers and 1% of Rickshaw Pullers have only 1 to 10 decimals of land. 7.7% Auto-rickshaw drivers have 31 to 40 decimals of land.

Land ownership of Rickshaw Pullers and Auto-rickshaw Drivers

Therefore, it can be inferred that Rickshaw pullers have almost no land in their ownership though Auto-rickshaw drivers possess a negligible amount of land.

Table 4.9: Land ownership of rickshaw pullers and auto-rickshaw drivers

Amount of Land, Decimal	Auto-rickshaw drivers, %	Rickshaw Pullers, %
1. No land	75.0	92.0
2. 1 - 10	11.5.0	2.0
3. 11 - 20	0.0	0.0
4. 21 -30	0.0	0.0
5. 31 - 40	7.7	0.0
6. 41 - 50	0.0	2.0
7. 51 - 60	0.0	0.0
8. 61 - 70	5.8.0	4.0
Total	100.0	100.0

Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 60 for rickshaw pullers

Preferred alternative professions reported by Rickshaw pullers and Auto-rickshaw drivers, if opportunities of current occupation die down

The study also investigated the occupations to which the existing auto-rickshaw drivers and rickshaw pullers would prefer to switch if the auto-rickshaws and rickshaws are withdrawn from the roads to introduce city bus service Rajshahi city corporation area (Table-4.10). In the case of auto-rickshaw drivers, nearly one-third (28.7%) have shared their preferences favouring business. Almost one-fifth has expressed the desire to go back to agriculture (farming activities). Over one-seventh would prefer to switch over as grocery shoppers, and 11.5% of auto-rickshaw drivers have refused to comment on the question. On the other hand, in the case of rickshaw pullers, over one-third (40%) shared.

Table 4.10: Preferred alternative professions of Rickshaw pullers and Auto-rickshaw drivers

Alternative profession	Auto-rickshaw drivers, %	Rickshaw pullers, %
1. Business	28.7	4.0
2. Grocery	13.5	8.0
3. Day labor	1.9	12.0
4. Farming activities	21.2	40.0
5. Pulling rickshaw in other towns	0.0	2.0
6. Factory worker	1.9	0.0
7. Bus diver	9.8	0.0
8. Others	3.8	4.0
9. No works	7.7	14.0
10. No comments	11.5	16.0
Total	100.0	100.0

Source: Authors' Calculation, Sample Size: 60 for auto-rickshaw drivers and 50 for rickshaw pullers

Table 4.10: Preferred alternative professions reported by Rickshaw pullers and Auto-rickshaw drivers, if opportunities of current occupation die down, their preferences favour agriculture; 16% of rickshaw pullers have no comments on the question, and 14% opined that they would not do any work without pulling a rickshaw.

Route-wise number of trips by Rajshahi University buses

Though Rajshahi University was established in 1953, its transport department started functioning in 1970. After our independence, Bangabandhu Sheikh Mujibur Rahman sanctioned 12 buses. As the number of students was small, the number of buses and their routes were also limited. Now the number of both buses and trips have increased with the increase in the number of students. Route-wise number of trips of RU buses are given in below (table 4.11).

Table 4.11: Route-wise number of trips by Rajshahi University Buses

Routes		Number of Buses	Number of Trips
1.	Banehsor	3	7
2.	Laxmipur	2	13
3.	C&B	3	8
4.	Court	3	8
5.	Bornali	2	8
6.	New-market	1	7
7.	Naohata	1	5
8.	Allupotti	1	7
9.	Kashiadanga	2	7
10.	Bihars	1	4
11.	BGB sector	1	6
12.	Katakhali	1	6
13.	BRTA(am chottor)	1	7
14.	Somsadipur	2	13
15.	Rajshahi rail station	1	6
16.	Naricelbaria Krishi unit	1	3
17.	Library trip	4	4
18.	Club trip	1	1
Total		31	120

Source: Rajshahi University transport department

Figures presented in table 4.11 indicate that 26 buses take 120 trips through 16 routes every day. Moreover, every Friday, two buses are used for Bazar trips for the teachers. Baneswar is the remotest route to the east, while Kasiadanga and Naohata are the remotest routes to the west and north.

Route-wise number of trips by RUET buses

Rajshahi University of Engineering and Technology (RUET) was established in 1964 as Rajshahi Engineering College with three engineering departments. Later it was converted into Bangladesh Institute of Technology (BIT), Rajshahi, in 1986 to enhance technical education. The institute was upgraded to Rajshahi University of Engineering and Technology (RUET) in September 2003 to expand education and research. Currently, there are more than 3000 students and 254 academic staff in RUET. The university provides its regular bus service almost everywhere in Rajshahi City for the convenience of students and academic staff. Information presented in table 4.12 shows that eight buses provide 21 trips in 10 routes every day.

Table 4.12: Route-wise number of trips by RUET buses

Routes	Number of Buses	Number of Trips
1. Court	1	4
2. Baya	1	2
3. Court-station	1	1
4. C&B -Vadra	1	3
5. Katakali	1	2
6. RUET-Quarter	3	3
7. 217 Fellow- Quarter	1	3
8. Bazar trip	1	1
9. Mohila Hall	1	1
10. Naodapara	1	2
Total	12	22

Source: RUET Transport department

Route-wise number of trips of Rajshahi College buses

Rajshahi College was established in 1873. It is said to be the third oldest institutions of higher education in Bangladesh following Dhaka College and Chittagong College. After establishment, the college became one of the leading centres of higher education for the inhabitants of then East Bengal, North Bengal, Bihar, Purnia and Assam. Rajshahi College was the first institution in the territory to offer bachelor and honours degree courses in various disciplines since 1878. There are about 4000 students in Rajshahi College.

For smooth transportation of the students, 11 buses are running on a fare in different routes. These buses take 66 trips in 5 routes every day. Figures presented in Table-4.13 show that Baneswar, Belpukur, Naohata and Kasiadanga are the main routes located 17 km, 12 km, 11.1km, and 6.8 km apart from the college campus, respectively. The number of buses compared to about 4000 students is not sufficient.

Table 4.13: Route-wise number of trips of Rajshahi College buses

Routes	Number of Buses	Number of Trips
1. Baneshor	4	24
2. Bellpukur	1	6
3. Horian	1	6
4. Naohata	3	18
5. Kashiadanga	2	12
Total	11	66

Source: Rajshahi College Transport department

Route-wise number of trips by RMC buses

Rajshahi Medical College (RMC), established in 1958, is the first medical college in the northern region of Bangladesh. Presently the college has only two buses for student's transportation. Figures presented in Table-5.14 show that two buses take a total of four trips to Dental and Court routes. Therefore, it can be inferred that most of the students use local public vehicles for their transportation.

Table 4.14: Route-wise number of trips by RMC buses

Number of Routes	Number of Buses	Number of Trips
1. Dental	1	2
2. Court	1	2

Source: Rajshahi Medical College Transport department

Comparison of transport information among buses of RU, RUET, RMC and RC

Figures presented in Table-4.15 show that 164 staff are working in RU, RUET, RMC and RC. Among them, 119 staff work in RU. In RC, 20 out of 23 are contractual staff, as all the buses run on a hired basis. The four institutions have 46 buses, among which RU has 26 buses of its own. It is further shown that RU

Table 4.15: Comparison of transport information among buses of RU, RUET, RMC and RC

Items	Rajshahi University	RUET	Rajshahi Medical College	Rajshahi College
Number of Staffs	119	20	2	23
Number of Buses	26	8	1	11
Number of Routes	18	10	2	5
Number of Trips	120	21	4	66

Source: Sample Survey Results

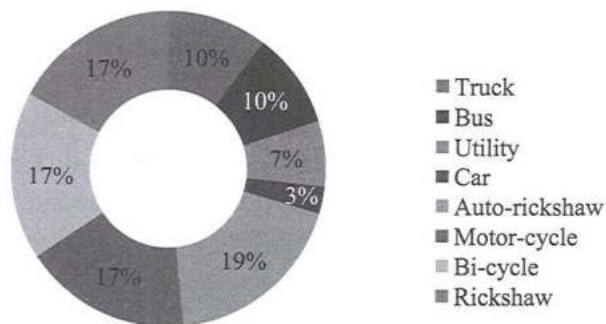
buses take 120 trips in 18 routes, RC buses take 66 trips in 5 routes, and RUET buses take 21 trips in 10 routes.

Apart from the buses of Rajshahi University, RUET, Rajshahi Medical College and Rajshahi College, buses of different government, semi-government, and autonomous institutions of RCC move throughout the city. On the other hand, the primary mode of transportation of the city's dwellers is battery driven auto-rickshaws. There are 19% auto-rickshaws, 17% motorcycles, 17% bi-cycles and 17% rickshaws, 10% trucks, 10% buses, 7% utilities and 3% cars running in the city area (Ashraful Haque, 2015). It is illustrated in diagram-1 the below:

In analysing the purpose of travelling, it is seen that 40% of the RCC people

Diagram-1: Shares of different modes of transport vehicles in RCC.

Shares of Different Modes of Transport Vehicles



use transport means for returning home, 25% for work, 22% for education, 6% for social activities, 4% for shopping and 3% for other purposes (Diagram-2).

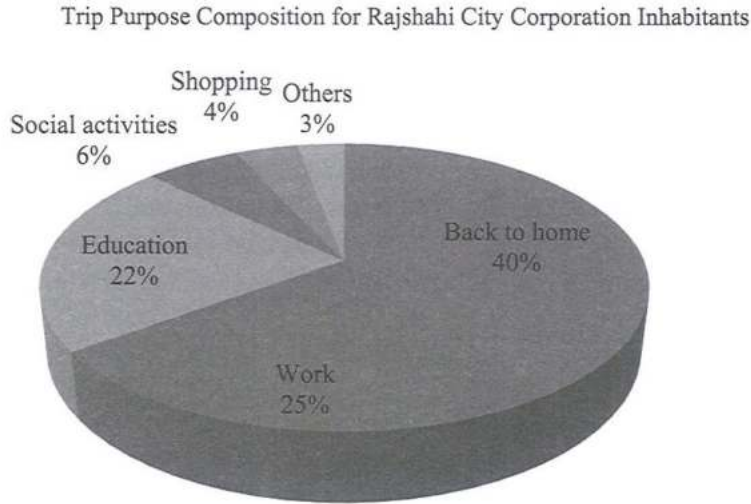
INTRODUCTION OF PLANNED CITY BUS SERVICE

The necessity of Planned City Bus Service

The population of Rajshahi City Corporation is about to cross one million. The number of permanent residents and the number of floating people are increasing day by day. There are many reasons behind the increasing population of RCC. These are:

1. Being a divisional town, many people come here for official purposes and leave the city after finishing their jobs the same day. As the city's main transport is rickshaws and auto-rickshaws, it takes more time and money to travel in this city. If town service is introduced, the floating people will be able to leave for their destination on the same day after completing their works in the city.

Diagram-2: Uses of transport vehicles by the city dwellers of RCC, 2015.



2. Rajshahi city is known as an educational city. From October to December, admission tests are held in Rajshahi University, RUET, Rajshahi Medical College, Rajshahi College. During this period, more than a million floating people visit the city. Besides, many students come to the city for admission coaching purposes after completing their HSC examination and stay for about one year. Also, every year more than 0.01 million students get admitted to different universities, colleges and institutions. However, after completing education, they stay in the city for preparing themselves for jobs and other urban facilities. Due to the increase of these floating people, the demand and supply of auto-rickshaws and rickshaws increase in the city, creating massive traffic jams.
3. As Rajshahi is a divisional city, job tests of different government, semi-government and private organisations are being held in Rajshahi City Corporation area, which is another reason for the city's increasing population.
4. Thousands of people from nearby areas visit the city for medical purposes as the 2nd oldest medical college in Bangladesh and other famous private clinics are here.
5. Rajshahi city is one of the famous places for tourists. The country's 1st museum (established in 1910), Zoo Park, the bank of Padma River are very famous spots for tourists. Many people from nearby cities visit the city, especially during the holidays.



Photograph-1: Rickshaws and auto-rickshaws at Zero point.

As mentioned earlier and other causes, the number of battery-driven auto-rickshaws and rickshaws is increasing day by day for their increasing demand and popularity among the travellers resulting in traffic jams in essential points. To portrait the scenario of traffic jams, two points named Monichatter and the Zero point is shown in the picture (Photographs 1 and 2). The illustration shows a more considerable number of rickshaws and auto-rickshaws compared to other vehicles.



Photograph-2: Rickshaws and auto-rickshaws at Monichatter

To remove traffic congestion from the city and ensure fast, safe, and cheap public transport, it has become crucial to introduce a city bus service. Despite existing narrow roads in some areas of the city, many critical busy roads will be

widened and well renovated in the master plan 2004-24 of RDA. The master plan includes the following components:

1. Alupotti-Talaimari road will be upgraded to two lanes;
2. The court-Bypass road will be widened;
3. Natore Road-Rajshahi Bypass road will be widened;
4. Construction of roads: Airport-Bypass connection road and Kapasia-Sucorno Mor road will be widened;
5. Binodpur-Halidagachi Taltola Mor road will be widened;
6. Bangabandhu Sheikh Mujibur Rahman Square will be constructed in Talaimari;
7. Greater road Shahid Captain Monsur Ali Park overpass will be constructed;
8. Bypass connection road will be upgraded to four lanes;
9. Choto Bongram Purbopara-Meherchondi and Barind Medical-Chakpara roads will be widened and renovated;
10. Alif Lam Mim Vatar Mor-Aligonj Bypass Mor road will be constructed;
11. Koirdara Mor-Sontospur bypass road will be constructed.

After implementing the RDA master plan, there will be no obstacle to launching a city bus service in RCC.

Probable Routes of Planned City Bus Service

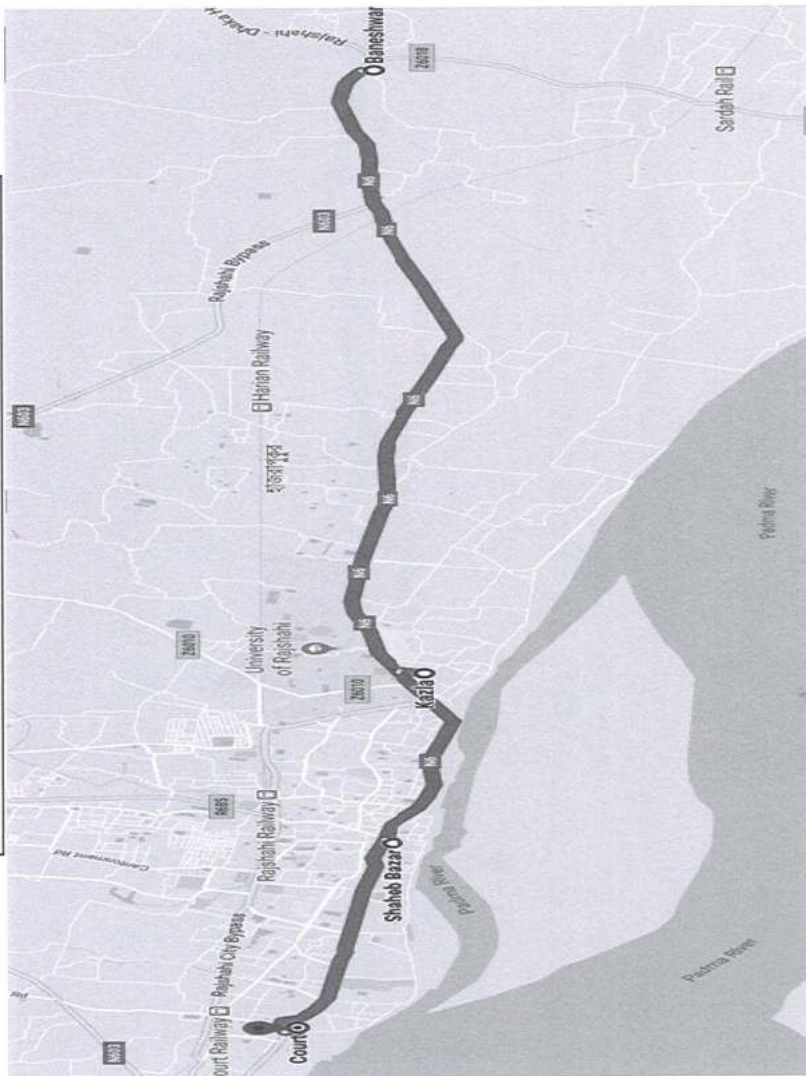
Time is a very vital factor for every nation. In developed countries, travel time is of the highest consideration in city life. To reduce travel time in everyday life for work or school, they are constantly improving and updating their transport policy and modes of transportation. To do so, this is highly recommended that town service for the citizens of Rajshahi City Corporation as incorporated in other city corporations would be the most prominent solution to the existing traffic problem.

To reduce the travel time and hassle, town service is now a situational demand for a long-term solution to the traffic problem in the Rajshahi City Corporation Area. Besides, it will reduce traffic jams and consequently lower road accidents. Auto-rickshaws are running with electricity. Recently RCC has been suffering from severe load shedding due to auto-rickshaws. If town service is introduced, this load shedding will be reduced.

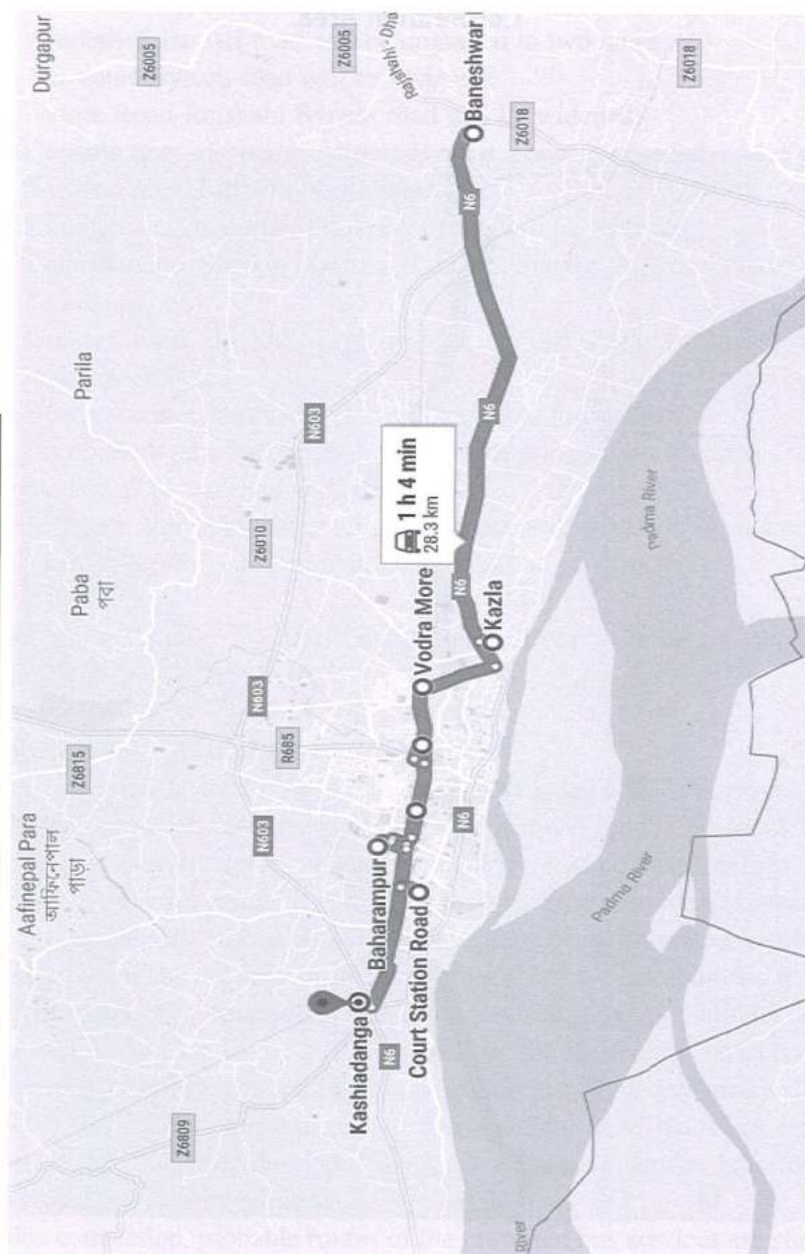
In this connection, probable routes of the proposed bus services are shown in maps 1 through 6 on the following pages.

Maps 1 to 6 show the proposed routes for town service in Rajshahi City Corporation Area.

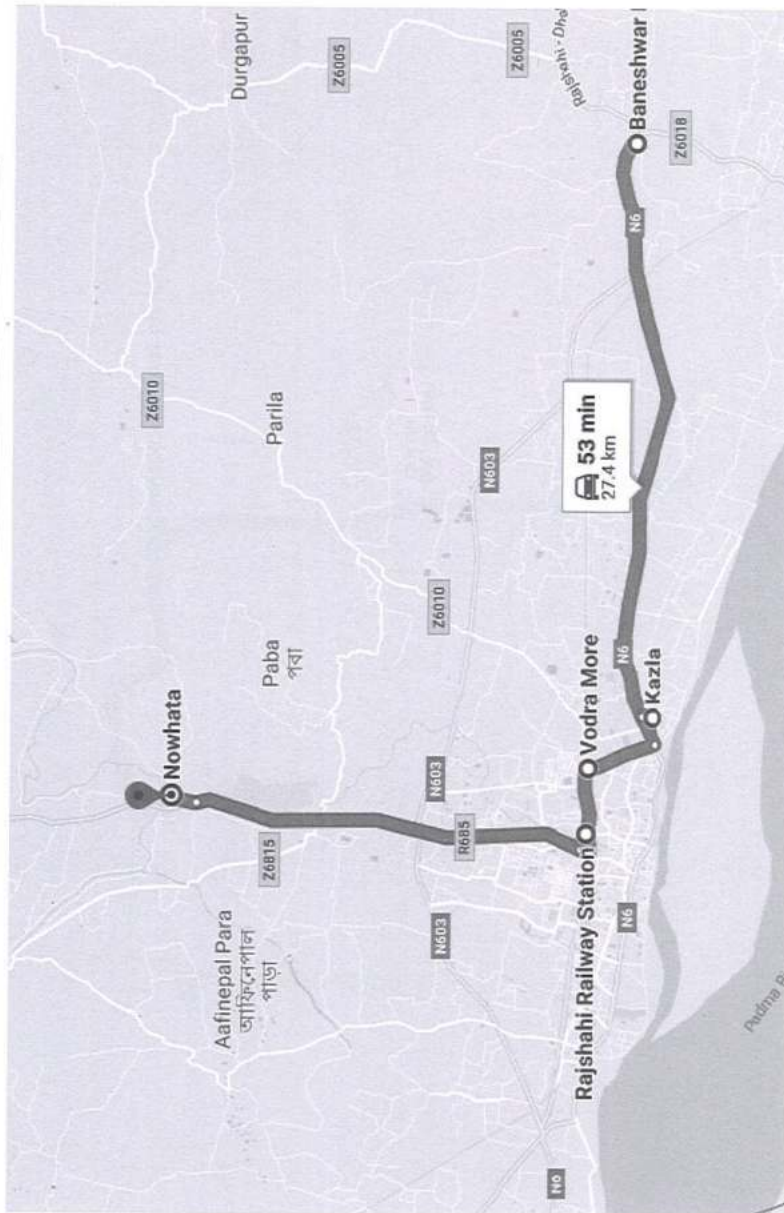
Map-1. Baneshwar – Kazla – Shaheb Bazar – Court



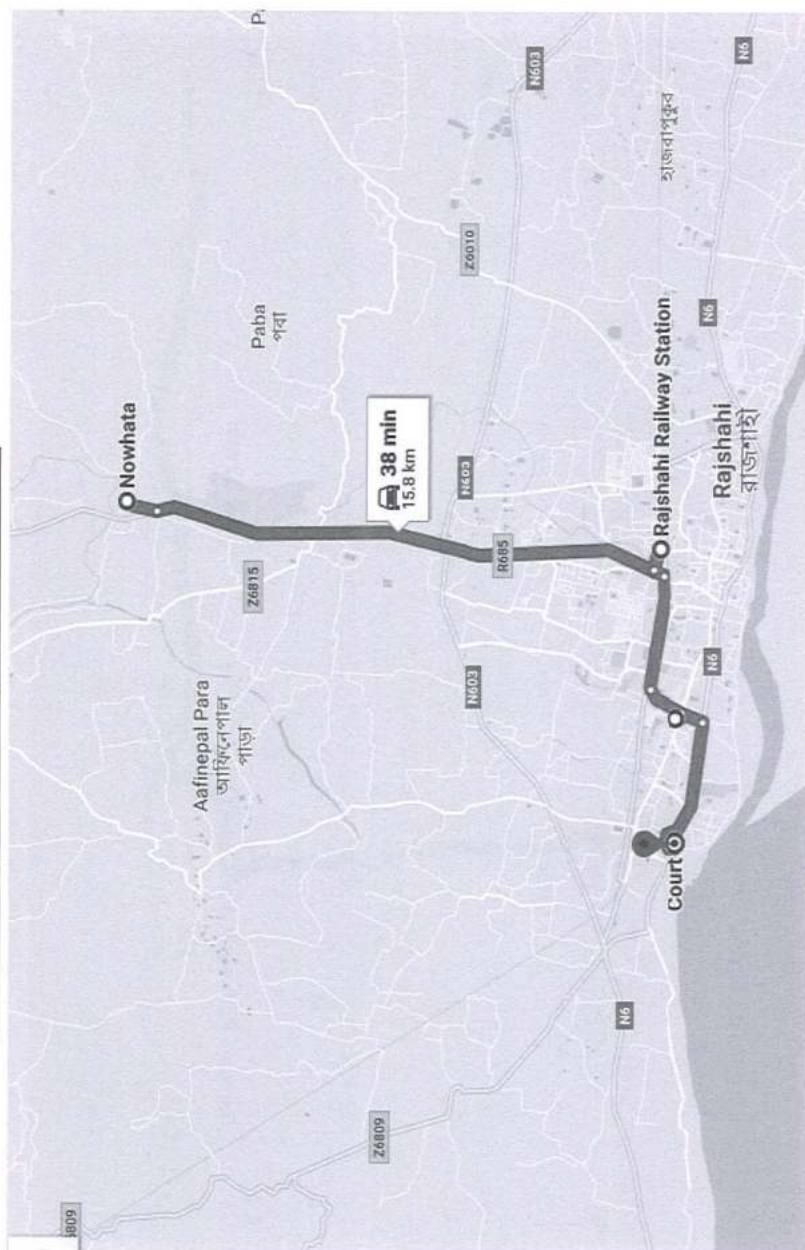
Map-2. Baneshwar – Kazla – Vodra More – Kasiadanga



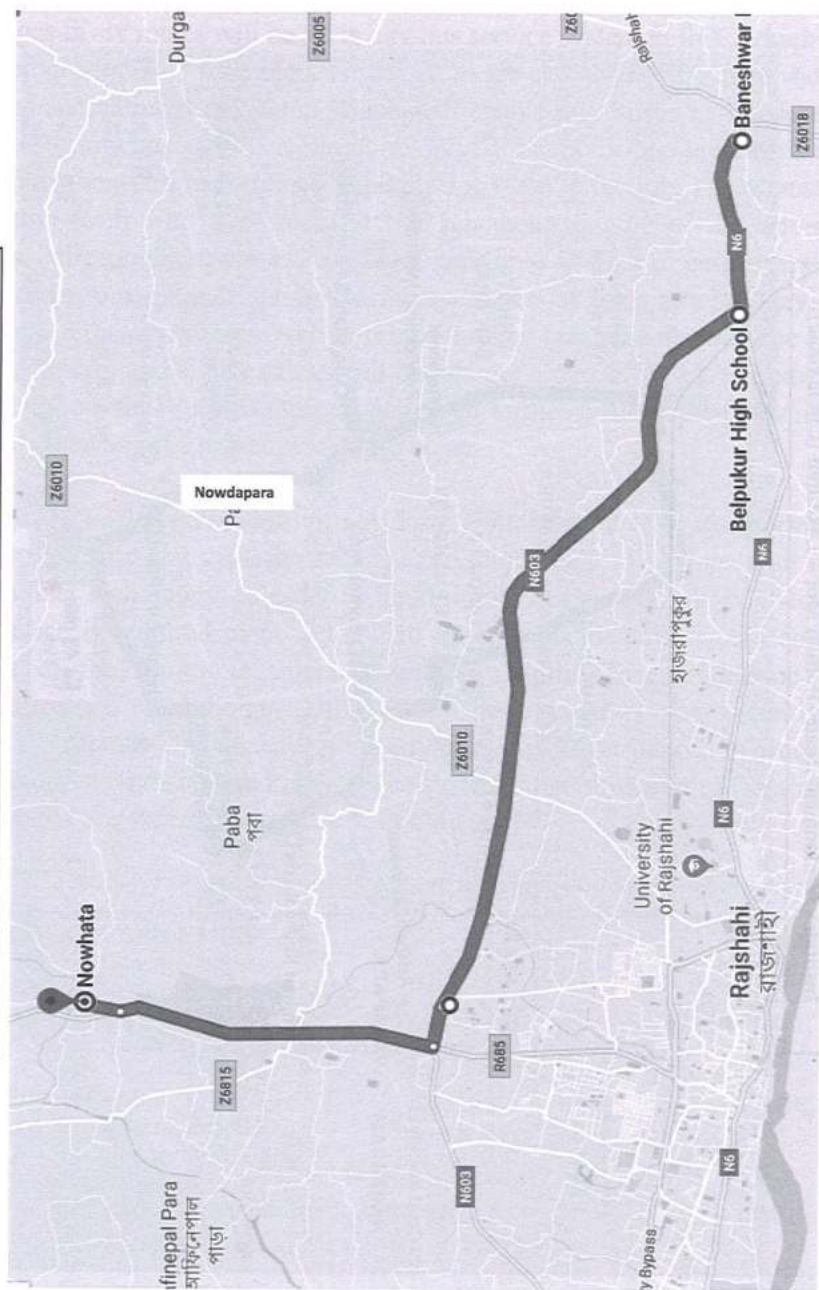
Map-3. Baneshwar – Kazla – Vodra More – Rajshahi Railway Station – Naohata



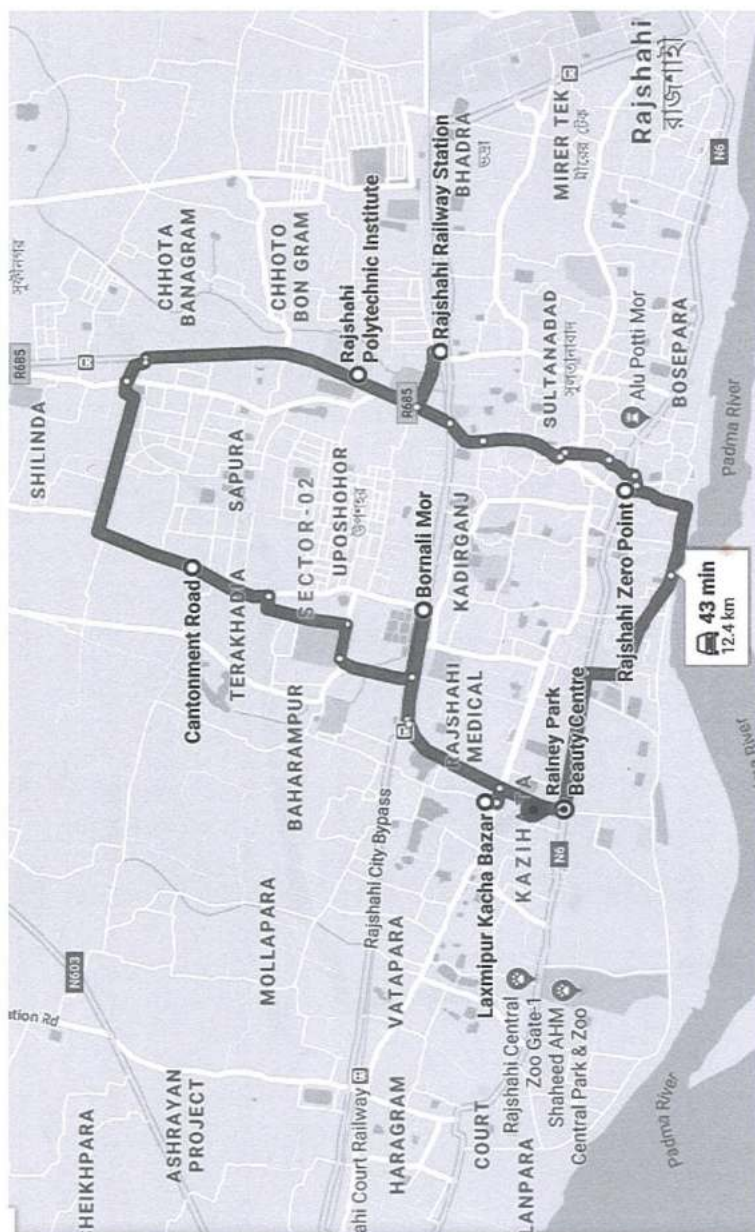
Map- 4. Naohata – Rajshahi Railway Station -- Court



Map- 5. Baneshwar – Belpukur – Naodapara – Naohata



Map-6. C&B – Rajshahi Zero Point – Railgate – Rajshahi Polytechnic Institute – Cantonment Road – Bornali Mor – Laxmipur (Circle route)



Number of Buses Needed for Running the Service

In every route there will be 16 bus stoppages. Therefore, total number of bus stoppages in six routes will be 96 in city bus service system in RCC which can be changed depending on the requirement. At every end of the city, there should be two bus stations with oil pump which will enable city buses not to depend on others. The city bus service will require only 18 buses for one route. Bus drivers and helpers must be well trained in permitting them in the job. There must be an inspection team who shall monitor bus schedule, training of the drivers and helpers, collection of approved bus fares, permitted number of passengers etc.

In order to popularise and increasing awareness of using city bus service, the residence of the city must be well informed through bus route maps at free of costs in printed form and signboards or bill boards. As a part of its advertisement, the benefits of city bus service must be conveyed to the common people which will help in increasing the passengers of the buses.

Methods of Fare Determination and Fare Collection of City Bus Services

Digital Bangladesh is a concept where everything ought to be done with the use of computer technology. In order to build digital Bangladesh, fare collection of bus service is required to be automated through digital devices and computer instead of the traditional manual method. Digital Fare Collection Cards facilitating one way, hourly, daily, 3-day pass, monthly pass, weekly, half monthly, 3 monthly, half yearly and yearly pass may be introduced in order to run a sound and well-disciplined bus service system. Determination of fares of RCC bus services are shown in the table 5.1 below:

Table 5.1. Fares according to category of people and travelling duration

ONE-WAY CASH FARES		FARE, %
1.	For General People	100.0
2.	For Seniors aged 65 and older	70.0
3.	For Disabled	70.0
4.	For Students from Primary to University	70.0
HOURLY PASS		FARE, %
1.	For General People	80.0
2.	For Seniors aged 65 and older	60.0
3.	For Disabled	60.0
4.	For Students from Primary to University	60.0
DAY PASS		FARE, %
1.	For General People	75.0
2.	For Seniors aged 65 and older	50.0
3.	For Disabled	50.0
4.	For Students from Primary to University	50.0

3-DAY PASS	FARE, %
1. For General People	70.0
2. For Seniors age 65 and older	50.0
3. For Disabled	50.0
4. For Students from Primary to University	50.0
 WEEKLY PASS	 FARE, %
1. For General People	70.0
2. For Seniors aged 65 and older	50.0
3. For Disabled	50.0
4. For Students from Primary to University	50.0
 BI-WEEKLY PASS	 FARE, %
1. For General People	70.0
2. For Seniors aged 65 and older	50.0
3. For Disabled	50.0
4. For Students from Primary to University	50.0
 MONTHLY PASS	 FARE, %
1. For General People	60.0
2. For Seniors aged 65 and older	50.0
3. For Disabled	50.0
4. For Students from Primary to University	50.0
 HALF-YEARLY PASS	 FARE, %
1. For General People	50.0
2. For Seniors aged 65 and older	50.0
3. For Disabled	50.0
4. For Students from Primary to University	50.0
 YEARLY PASS	 FARE, %
1. For General People	50.0
2. For Seniors aged 65 and older	50.0
3. For Disabled	50.0
4. For Students from Primary to University	50.0

Digital cards structured with the above schemes will ensure optimum revenue earning from the bus services resulting in the assurance of low-cost transport services for the ordinary people of RCC. In order to mitigate conflict between passengers and bus contractors, route wise bus fare chart should be displayed in the visible place of the buses. The initial or starting fare must be taka 2; takaone will be charged for every kilometre. The minimum fare will be taka 5.

There must be a driver and a supervisor on each bus. The supervisor would monitor whether every passenger is paying the required fare according to the route. Bus fare should be paid with digital cards. Until issuing digital cards in the buses, a manual ticketing system must be followed. After a certain distance, well-structured bus stoppages should be built for comforting passengers waiting for buses. For this purpose, RCC should invite well-established companies to sponsor building modern bus stations at every stoppage.

Recommendations and Conclusion

Policy Recommendations

To introduce City Bus Service, our recommendations are as follows:

1. In order to introduce city service a new department named "RCC Bus Department" should be established.
2. At the initial stage, the RCC should contract with the existing bus service departments of Rajshahi University, Rajshahi College, Rajshahi Medical College, and RUET to transfer their buses under Rajshahi City Corporation. The City Corporation may buy the buses or pay rent to this organisation. Their staff can be utilised for this purpose. Wages should be paid to the staff monthly to find job security and work safely.
3. There may be six routes in RCC. These are:
 - Baneshwar – Kazla – Shaheb Bazar – Court;
 - i. Baneshwar – Kazla – Vodra More – Kasiadanga;
 - ii. Baneshwar – Kazla – Vodra More – Rajshahi Railway Station – Naohata;
 - iii. Nowata – Rajshahi Railway Station – Court;
 - iv. Baneshwar – Belpukur – Naodapara – Nowhata;
 - v. C & B – Rajshahi Zero Point – Railgate – Rajshahi Polytechnic Institute– Cantonment Road – Bornali Mor – Laxmipur (Circle route).
4. In every route, there must be specific stoppages. Without stoppages, no buses shall halt and take passengers. Buses shall leave their stations every 10 minutes.
5. Different sorts of cards like hourly, daily, weekly, monthly, half-yearly, yearly for fare collections (in future smart fare cards) shall be introduced on a concession basis.
6. According to RDA, two road construction projects from Airport road to the Bypass road and Kapasia bazaar to Sucorno Mor will be completed in June 2018. Within June 2020, two projects will be completed to construct an overpass from Greater Road to Shahid Captain Monsur Ali Park and a four lane upgradation of the Bypass road. Upgradation of roads from Choto Bongram Purbopara to Meherchandi and from Barind Medical to Chakpara will be completed in June 2020. Besides these projects, following the RDA master plan, many other projects will be taken for implementation very soon. These upcoming projects will gradually pave the way for a smooth town service system.
7. In the main centre point of the city having busy and narrow roads, rickshaw and auto-rickshaw may run there as buses cannot move without specific routes.

8. Separate lanes should be built for cycles, rickshaws, and auto-rickshaws to smooth the buses' running.

It is a well-established fact that adequate and efficient mass transportation service plays an important role in combating traffic congestion and improving safety within urban areas. So, city bus service system is essential for ensuring safe, comfortable and cheap movement of the city dwellers of RCC. In this paper, an attempt has been made to present the conditions of the existing transport system in Rajshahi City Corporation and identify the problems of transportation of RCC.

At present, the population of Rajshahi city is about one million. The population is rising day by day. So, RCC authorities should build an underground rail system (metro) soon. Otherwise, Rajshahi city would be a congested and blocked city like Dhaka. Besides RCC, other cities like Chittagong, Khulna, Sylhet, Barisal, Rangpur and Mymensingh should construct underground railways. Otherwise, we would not be able to build Sonar Bangla, the long-cherished goal of the Father of the Nation Bangabandhu Sheikh Mujibur Rahman.

Conclusion

Bangladesh is one of the fastest-growing countries in the world. Already it has achieved an 8% plus growth rate. In all social studies, our country's achievements are remarkable. To cite some of them will suffice; literacy rate 72.3%, life expectancy 72 years, per capita income 1272 dollars, population growth rate 1.37%, electricity coverage nearly 90%. It is noteworthy that our country already has got developing country status. However, still, many problems remain to be solved in order to get sustainable developing country status. Infrastructural weakness is one of them, perhaps the most important one. Especially our country is incurring huge losses in terms of material and human lives because of the absence of modern and sound transport infrastructure (Rail, bus services). Rajshahi City Corporation is not an exception in this respect as well. Although RCC is one of Bangladesh's oldest city corporations, there is still no city bus services. It is a matter of great regret that with a population of nearly one million, RCC has miserably failed to develop a city bus service, not to speak about metro rail or subway service. In the developed country, metro, bus, trolley-bus, trams are the primary transport means of huge cities like RCC, DCC, KCC, and CCC. Even there are laws or rules that cities or towns with a population of one million must have metro rail or sub-way services. China and India are building metro rail or subway at a rocket speed. Already China has built nearly four thousand kilometres

of metro lines, whereas India has built only one-fifth of that of China, i.e. only four hundred kilometres. The number of populations of both countries is nearly the same: China 136 crores and India 130 crores.

However, in respect of urban transport facility particularly metro rail India is lagging behind China ten times. But what about our cities like DCC, RCC, KCC, CCC, and others? The services of our cities are like that of 18th century Europe. For RCC, we think it is like that of the middle ages of Europe. Attempts have been taken by the private sector bus owners to introduce bus services but failed miserably. Therefore, it is our firm conviction that the private sector would not come forward. Only RCC can and must introduce a city bus service here in RCC for the more significant benefits of RCC inhabitants. RCC must, at the same time, visualise building metro-rail or subway in RCC soon.

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Transforming the Bangladesh National Youth Policy 2017 into Action Plan: What Do the Youth Want?

Sayed Saikh Imtiaz*

Abstract

Like all other countries, youth in Bangladesh requires both a primary human resource for development and key agents for social change, economic development, and technological innovation. In order to use its full potentials, Bangladesh requires the need to implement the National Youth Policy 2017. The first step of this should be to transfer the youth policy into an action plan. The policy and the action plan can be used as an instrument to empower youth only if transferring the policy into action ensures the priorities of the youth. Based on a mixed-method approach using a survey done among 846 youth and qualitative data collection using FGD and KIIs from all eight-division headquarters, this study focuses on youth's expectations to translate National Youth Policy 2017 into an action plan. The paper is divided into several sections; in the first section, we have discussed the study's rationale, the second section deals with the methodology, the third section focuses on the critical findings, and the last section briefly states vital recommendations based on the study findings.

JEL Classification O15 · P36 · Y20

Keywords: Youth · Policy · Youth Action Plan

1. Introduction

1.1 Study background

The UN General Assembly proceeded with the "World Programme of Action for Youth to the Year 2000 and Beyond". It recommended National Youth Policies for

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the member states, recognising that "young people in all countries are both a major human resource for development and key agents for social change, economic development and technological innovation" and "how the policy addresses the challenges and potentials of young people will influence current social and economic conditions and the well-being and livelihood of future generations" (UN, 1996). As the majority of the population consists of young people who are full of potential, the need for a National Youth Policy cannot be denied (UNESCO 2014 & UN 2018). An actual condition of effective youth policy is the involvement of children and adolescents in all decisions relevant to them. However, they will not commit themselves unless they are convinced that their involvement affects their future and what they decide today will concern their essential life circumstances tomorrow.¹ Therefore, youth participation should be a guiding principle of youth policies at all levels, not just the national level.² Participation promotes the well-being and development of young people. The more opportunities a young person has for meaningful participation, the more experienced and competent he or she becomes. It allows more effective participation, which in turn enhances development'.³

Transferring the youth policy into an action plan is crucial to fulfilling the expectations of the youth in ensuring the development of a country from every aspect.⁴ Young people apprehend the newest knowledge, generate new ideas and endow the courage to explore beyond the age-old traditional norms and practices (Crowley and Moxon, 2017). Youth are thus full of potentials and possibilities to initiate change in any society (UNESCO 200). The number of youth in any country is of prime significance, as currently, young people represent a majority of the population in most developing countries, which are going through the phase of demographic dividend.⁵ Hence, every step taken by the youth and every step

1 European Commission (2001): Study on the State of Young People and National Youth Policy in Europe. Part I (Executive Summary), IARD.

2 Government of South Australia (2000): Youth Participation Handbook: A Guide for Organisations seeking to involve Young People on Boards and Committees.

3 Rajani, R. (2000, UNICEF): Discussion Paper for Partners on promoting Strategic Adolescent Participation, quoted in Lansdown, G. (2001): Global Priorities for Youth. Youth Participation in Decision-making.

4 For a detail discussion see Commonwealth Secretariat 1998, Council of Europe 1997, 2002, 2003, European Commission (IARD) 2001, Government of South Australia Office of Employment and Youth 2000, ICNYP 2002, Lansdown 2001, Organisation Internationale de la Francophonie 1999, Sayfuddin 2001, Tolman 2001, United Nations Economic and Social Commission for Asia and the Pacific 1999, UNESCO 2004

5 See UN 2005 and 2009, Lee and Mason, 2006, Lin 2012, United Nations Department of Economic and Social Affairs, 2014, UNFPA 2014

taken for them needs to include a youth perspective to ensure the benefits of such a demographic dividend. The way young people are engaged today will determine the prospects for the future (UNESCO 2014). Though young people are prominent as "political actors, innovators, entrepreneurs and social workers", disproportionate social, economic and political barriers have been reported preventing them from revealing their full potential (ibid). Many young people across the globe are still experiencing "interlocked forms of discrimination, limited political inclusion, high levels of poverty, and limited access to health systems, educational opportunities and decent jobs" (World Youth Report UN 2003),

To utilise their full potential, young people need to be empowered. Achieving the 2030 Agenda for Sustainable Development also requires the engagement of the youth as more than one-third of SDG targets reference young people explicitly or implicitly, with a focus on empowerment, participation and/or well-being (Hwang and Kim, 2017, Raikes et al. 2017, UNDP 2017 & UN 2018). Youth participation needs to be reflected at all levels of development which requires youth-friendly infrastructure, policies and patronisation of youth organisations (UNESCO, 2014). Considering the urgency, the Government of Bangladesh has initiated the National Youth Policy 2017. The policy can be used as an instrument to empower youth only if transferring the policy into action ensures the priorities of the youth (ibid). It is crucial as this can help develop a strong partnership between the young people and different stakeholders, including the government, while providing ownership of the whole process to the youth (Barua, 2016). Within the scope of this paper, we tried to understand the critical expectations of the youth in transferring the youth policy into an action plan. The paper is divided into several sections; in the first section, we discussed the study's rationale, the second section deals with the methodology, the third section focuses on the critical findings, and the last section briefly states critical recommendations based on the study findings.

1.2 Study rationale

The primary reason to explore the priorities of the youth for their development is that if Bangladesh wants to transfer the demographic dividend into the economic dividend, it requires a comprehensive youth development action plan. Youths' opinions about the priority areas for such an action plan can surely help policymakers make informed decisions. Bangladesh currently has massive scope for the demographic dividend (Roys and Kayes, 2016) with a potentially higher

share of workers than dependents, allowing for faster economic growth.⁶ The demographic dividend has been found as significant as it helped improve living standards of the population through increased: (i) Capital formation, (ii) Savings and investment, (iii) Female participation in the labour force, (iv) Improved quality of labour force, (v) Slowing unsustainable fractionating of holding and releasing the pressure of absorbing the growing labour force on limited agricultural land, and (vi) Increased demand for goods and services (Mazid, 2017).

The number of dependents per 100 working population has been declined from over 100 in 1961 to 60 in 2010, and the trend is continuing (*ibid*). Since 2007, Bangladesh has been reported to have more working-age people than non-working, known as the demographic dividend, and Bangladesh will enjoy this window of opportunity till 2040 (Liton & Molla, 2017). According to another study on Demographic Transition and Demographic Dividend in Bangladesh: 1950-2100, using the UN projections (2010 Revision), demographic dividend in Bangladesh started in 1980, according to the low variant, which will end in 2035 and according to the medium and high variants will end in 2040 (Mazid, 2017). Thus, Bangladesh has already passed three decades of demographic dividend, currently at the midway point of the dividend period when more than three decades pass on (*ibid*). According to the prediction of the International Population Conference, 2009, the countries in South Asia would acquire a demographic dividend for a period, on average, of 50 years. On average, Bangladesh would acquire the highest dividend among the countries, estimated at around 1.0 per cent from 1980 to 2020 (*ibid*). As transforming the demographic dividend into an economic dividend comes within a specific time frame, urgent intervention to utilise the dividend more efficiently is needed (Liton & Molla, 2017).

Currently, more than 65 per cent of the population belongs to working age, between 15 and 64 (*ibid*), and according to BBS (2015), one-third of the population is young, belonging to 18-35 years of age in Bangladesh. According to the national youth policy, the "youth" age is between 18 and 35, and almost 45 million people fall within that age range (Biswas, 2017). To utilise the demographic dividend at its most, countries have to plan for it when many are still

⁶ During the demographic transition, as in many countries, declining infant and child mortality helped to spark lower fertility, effectively leading to a temporary baby boom. As this cohort moves into working ages along with sharp declines in fertility, significant changes occur in a population's age structure. Mortality rates also decline followed by a fall in fertility rates. As a consequence of declining population growth, there is a bulge in working-age population and shrinking dependent population that can allow for faster rates of economic growth.

young before entering the workforce (Mazid, 2017). Failure to provide opportunities to the growing young population may result in rising unemployment, followed by "increased risk of social upheaval" (ibid). Therefore, to translate the opportunity of demographic dividend into a reality, strong collaboration among different stakeholders, including youth, guardians, policymakers, development partners and other social actors at all levels, is needed (Mazid, 2017). Undoubtedly, developing a comprehensive, well-thought, and widely consulted youth policy and National Action Plan can be the first step to achieve this.

2. Methodology

The study used a combination of both quantitative and qualitative methods. The quantitative method used a structured survey questionnaire, while the qualitative methods included FGD and in-depth interviews. Total 24 FGDs and 24 IDIs were conducted in all of the divisional headquarters. While choosing the respondents for the FGDs, a male-only, a female-only and a mixed group were picked up purposively in all study locations. The respondents were from various economic and educational backgrounds. A balance was maintained between the 'marginalised' and 'mainstream' youth in all FGDs. From each of the FGDs, one respondent was recruited for an in-depth interview. All of the eight divisional headquarters were covered for the survey. Schools, colleges, universities, public places and households were targeted for the survey. As no clustered sampling was done, data collection was not confined to significantly of the concerned districts. A total of 846 valid responses comprising 423 males and an equal number of females were the sample of the survey. Three age groups were targeted for this research: 15-18, 19-24 and 25-35 years. From these samples, graduate students were the prominent group.

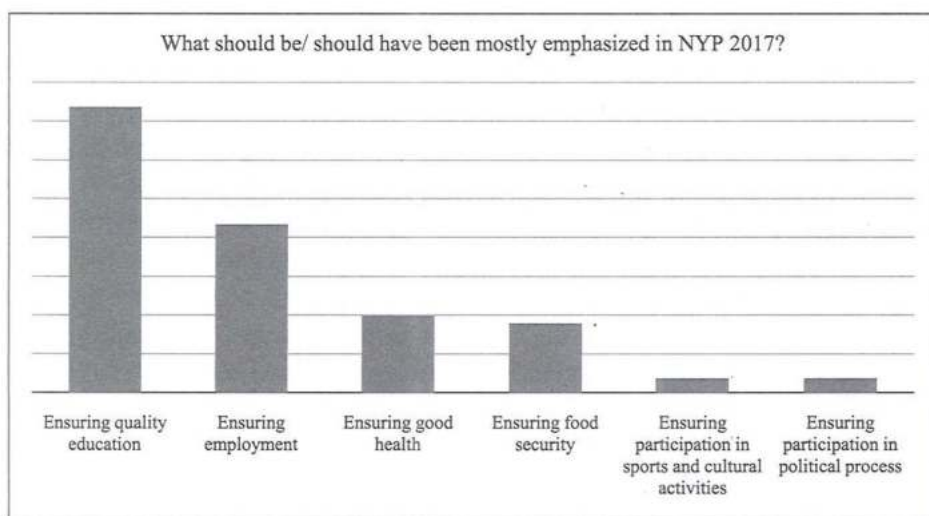
3. Key Findings

The key findings of the research range from considering the NYP 2017 as necessary to recommendations from the respondents regarding the NYP2017. Most of the youth thought that a National Youth Policy was important for Bangladesh. Around 60% of youth responded this way. Another 33% thinks that NYP is necessary for Bangladesh. on the other hand, 4.4% thinks it does not matter, and 2% answered unnecessarily. Only 17.8% of the respondents reported knowing about the policy, and the rest did not. Moreover, only 7.7% answered that they had read the policy.

3.1 Investing in quality education should be the ultimate priority

One of the prime priorities of young people regarding youth development was investing in quality education. Among the options: Ensuring quality education, ensuring employment, ensuring good health, ensuring food security, ensuring participation in sports and cultural activities, ensuring participation in the political process, ensuring safety from climate change risks, and Others; ensuring quality education was the most important one according to the youth. This option was selected by over 45% of the valid responses. Employment and health received 26 and 12 per cent responses accordingly.

Figure 1: Opinion regarding what should be/should have been primarily emphasised in NYP 2017



The development of ICT was regarded as the best strategy for ensuring quality education. It gained 37.5% response from a total of 819 valid respondents. Uniform education system, free education, science education, and district level universities gained 21, 10, 7 and 6%, respectively. Other options gained less than 5% response. For ensuring quality education, the young people also suggested some more recommendations during the qualitative study. The first of those was introducing a unitary education system merging all the prevalent mediums of education. Apart from them, they suggested that brilliant and qualified teachers at the very primary stages for ensuring quality education. Currently, the school teachers are paid the least, and the meritorious students become reluctant to join this noble profession. So, if we want to improve the quality of education, we need to recruit eligible teachers, offering them well-paid salary packages. The young people also claimed for fully subsidised education system up to university level.

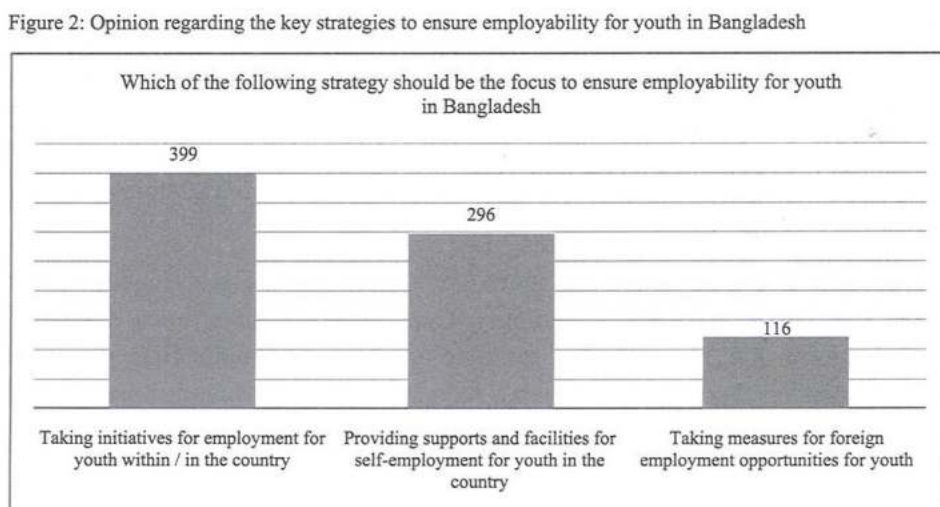
As the youth said, the dropout rate is still high in our country, and consequently, many meritorious students stay out of education for being poor. The whole nation will suffer if we miss grasping their talent. Hence, we need to support them, and subsidised education can be an effective solution.

The young people also suggested lowering the cost of education in the private sector. Enhancing opportunities for vocational training in all branches/ forms of higher education was another priority of young people.

3.2 Generating Employment Opportunities for the youth within the country

While exploring youth's priority regarding employment opportunities, it was very encouraging to see that the majority of them emphasised creating jobs within the country rather than creating opportunities for jobs abroad. However, the largest cohort of youth, 399 respondents, consider private or public jobs within the country as the priority, while 296 and 116 respondents respectively opined that providing self-employment opportunities and measures for foreign employment opportunities should be the priority. Notably, Males voted significantly more for employment opportunities in the country, and females voted more for providing support and facilities for self-employment.

Figure 2: Opinion regarding the key strategies to ensure employability for youth in Bangladesh



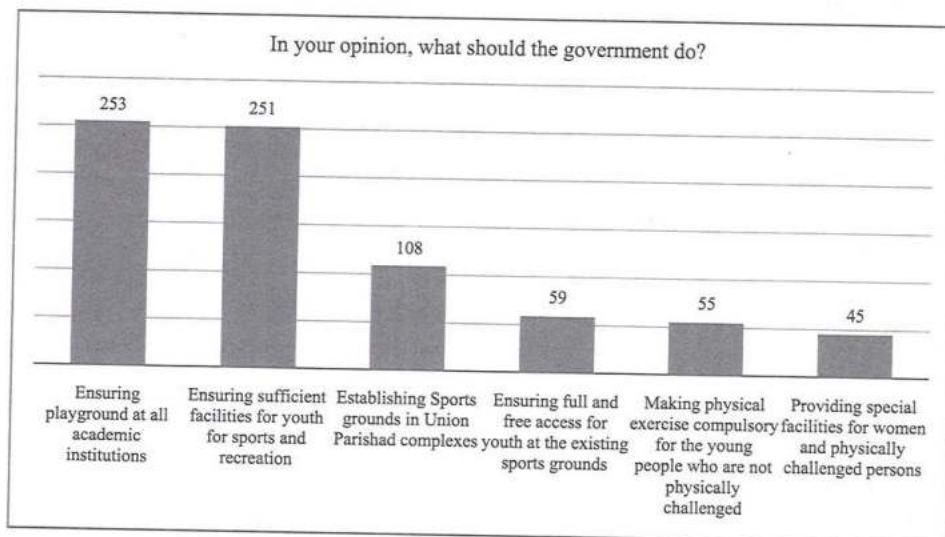
Around 34% of the youth prefer self-employment in the business sector while 30% and 25% prefer the agricultural sector and small and medium industries, respectively. This pattern is consistent with the youth's creative and disruptive

side. The lack of financial backing put the heavy industry in the last place as only 11% showed interest. In addition, the youth chose training as the number one priority for self-employment. Almost 40% of the respondents identified training as the main requirement for being self-employed. Then come capital, advice and other expertise. So, the youth regards technical knowledge and professionalism over financial backing and networks. Low-interest loan facilities and advises-suggestions were the other two significant expectations from the government. Considering the scarcity in the job sector, the youth from all the divisions demanded to generate more employment opportunities. Instead of intending to enter any particular sector, they claimed more scopes of jobs in both private and public sectors. While discussing current job scarcity, many young people also drew attention to the fact that many high-level jobs remain vacant due to a lack of native eligible people. In many corporate houses, RMG factories, and other relevant sectors, the highest positions are occupied by foreign talents. Hence there remain scopes for strengthening our youth with more skills and capacities to mitigate the problem of unemployment recruiting our country people in the topmost positions. In this regard, the young people are recommended for advanced training on skill development, capacity building and leadership. They claimed for low-cost training and well-organised training institution. The youth are enthusiastic about exploring innovative ideas for initiating ventures but opined that easy access to credit like soft loans and collateral-free loans. Some young people mentioned allowance for the unemployed. Though it has already been initiated, they claimed for effective activation and more extensive coverage.

3.3 Equitable sports and recreation facilities should be ensured

The youth prioritised sports facilities and institutional integration. Their priority is sports and recreational facility and connected to it is the second option: playgrounds at educational institutes. Male respondents opted for sports facilities, playgrounds and Union Parishad sports complexes. On the other hand, females opted for female facilities accordingly. Regarding the government's input to ensure sports and recreation of suitable quality, the youth first prioritised playgrounds in school colleges, sports- recreational facilities, and sports grounds at Union Parishads. Free access, compulsory system and facilities for women-physically challenged were not chosen that much. Sports facilities and playgrounds at educational institutes made up 65% of the total responses showing the depth of this necessity. The young people focused on equitable facilities to minimise the gaps between rural and urban, rich and poor and most importantly, the gender gaps.

Figure 3: Opinion regarding the most important factors for sports and recreation of youth



3.4 Political inclusion of the youth must be assured at all levels

Today's youth recommended for political inclusion of them to be assured at all levels. They have their own perspectives to join politics. They are aware that today's politics is very much polluted with corruption and the culture of terrorism, the youth feel the urgency to eradicate those from being within the structure, and hence they claim for the involvement of youth. They want to obtain the leadership position through politics to heal the social problems with their ideas, strength and licit means. To ensure a youth-friendly political atmosphere, they need structural changes to allocate minimum representation of the youth at all levels of the political system. The young people repeatedly pointed out that if we declare ourselves a democratic state, we first need to ensure freedom of speech, which fell under threat many times. So, it is alarming for us to upheaval from this condition. As soon as the freedom of speech is liberated, the young people from both inside and outside political parties will participate actively and effectively.

3.5 Balancing virtual and social life

One of the most striking and contemporary recommendations from the youth was to secure a balance between virtual and social life. In this era of digitalisation, there is no scope for avoiding ICT, social media, and virtual life. Most of our daily tasks have been digitalised, and initially, it was for easing our everyday struggles and connecting more people and building networks. The youth agreed that they have a broader network now than at any time before. They communicate with

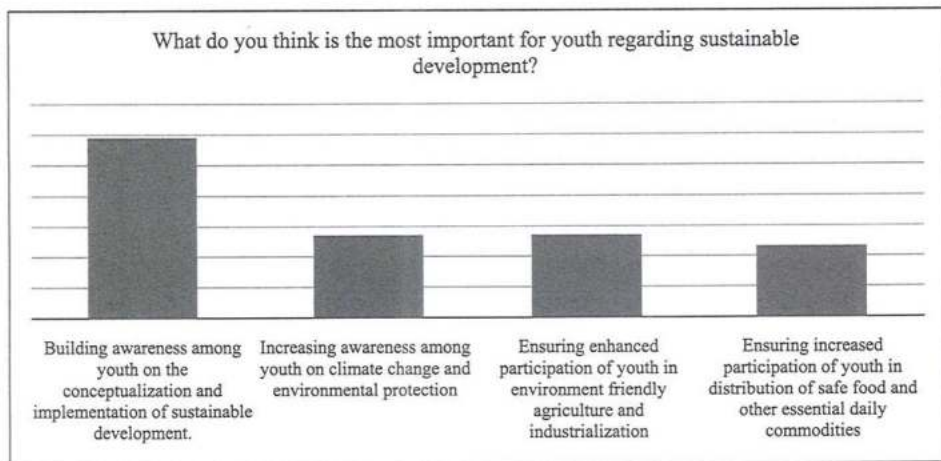
people of different levels, but genuinely feel they have somehow isolated from their own social life. All the bondages are built virtually, and behind that, they remain secluded.

Moreover, their crisis gets bitter when their guardians keep rebuking rather than cooperating with them. They feel the isolation, and at the same time, they do not find a way to get back to their social life. They urged for support from their parents and teachers, and they hoped for youth-friendly consultation and dialogues to balance social and virtual life. When others treated the youth as careless about social life, they pretended to value social life a lot. They want appreciation from there. Hence they want cooperation and proper guidance.

3.6 Eliminating drug addiction from society at any cost

For a long, many young people have been derailed by the addiction to the drug. The young people shared their experiences of being offered by drug dealers so shamelessly. The dealers are spreading their business under the shades of some political leaders, and thus they are remaining out of punishment. The youth urged for their punishment. Considering the present situation, there must be more rehabilitation centres. Effective consultation or psychotherapy need to be merged with that rehabilitation for a sustainable outcome. To prevent youth from drug addiction, all kinds of addictive drugs must be seized by the authority. According to the suggestion from the young people, specific authority can be introduced to monitor and control the selling and buying of drugs.

Figure 4 : Opinion regarding sustainable development



3.7 Ensuring Sustainable Development

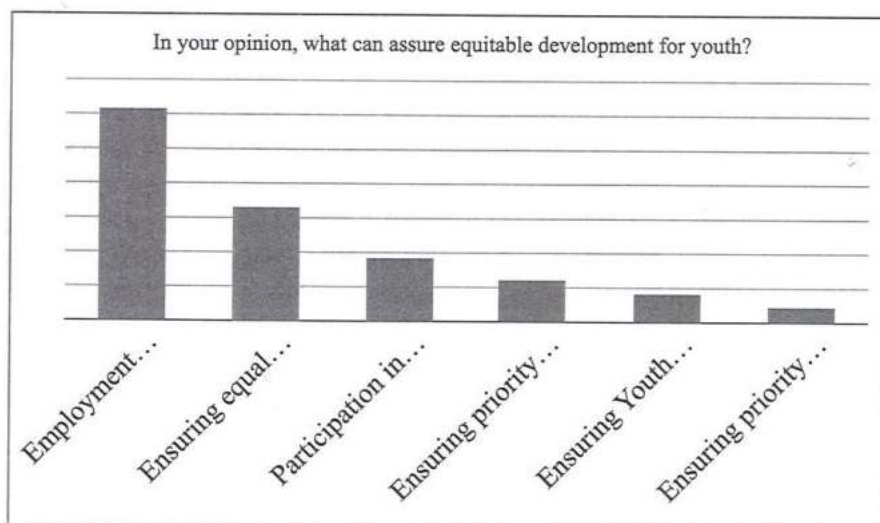
Awareness of sustainable development is still a significant factor in sustainable development. Climate change has been included in the curricula for many years, but sustainable development is still introduced. Campaigns and events are thought of less importance in this scenario.

There were regional priorities that young people from Khulna demanded food security and safe drinking water. The community people from the Khulna division have to lead tough life. They are more prone to natural disasters, are more prone to saline water, and suffer a lot to get sweet water. Due to the prevalence of shrimp cultivation, the existing sources of sweet waters are also being polluted. The young people from Khulna drew attention to these facts and demanded to ensure food security and safe drinking water.

3.8 Ensuring Equitable Development and Equal Opportunities for Women\ Female youth\ and Girls

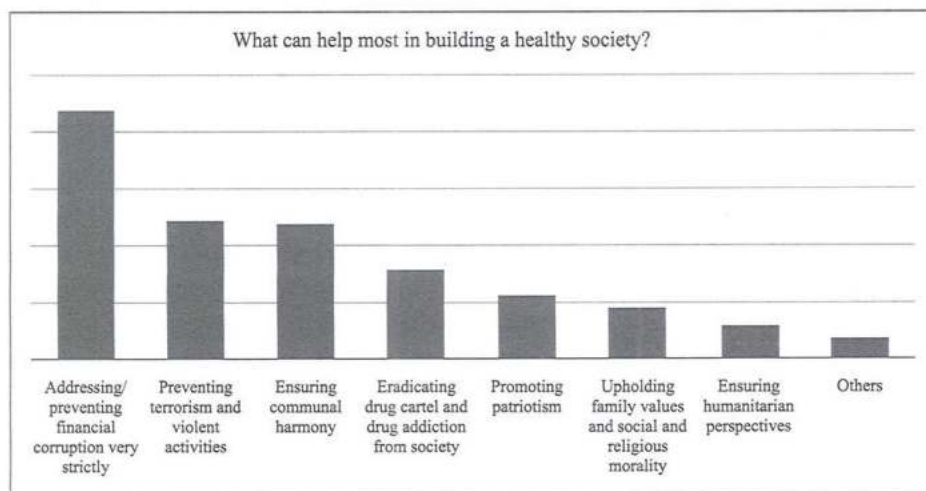
For equitable development for youth, 45% of the youth consider Employment facilities and working environment most important. They were followed by equal opportunity and participation in power structure and politics.

Figure 5: Opinion regarding what can assure equitable development for youth



32% of respondents chose to address financial corruption as the first priority. Then comes antiterrorism (18%) and communal harmony (17.5%). Other options included anti-drug steps, patriotism, values and humanitarian perspective establishment.

Figure 6: Opinion regarding what can help most in building a healthy society



Today's young people seem to be more aware of the equal rights of men and women. They demanded support at the family level as well as social level. They offered themselves to fight against the social taboos towards gender equality but wanted appreciation from others. Many young people focused that if the boys learn to treat girls as their equal companions, they will be grown up keeping such behaviours and attitudes. Unless we intervene in the first stage of their lives, we will fail to bring effective changes.

3.9 Addressing Special Needs of Marginalized Youth

To build an inclusive society, the youth are interested in working for marginalised groups like ethnic minorities, people with disabilities, Adivasis, transgender people and people with Different Sexual Orientations and Gender identity. Moreover, surprisingly, they are also interested in entering such professions where they would have the scope of working for people who have been stigmatised for a long. They mentioned that there are mostly NGOs working for marginalised people, but if there were more patronisation from the government, it would be easier for them to gain social acceptance. Hence, they also demanded inclusive policies and mechanisms. Again, in this issue, they suggested intervention through the academic curriculum. The young people also stated that if we want to empower the marginalised people, sensitivity towards them would only be halfway, we need to provide them with education, and initially, we need a particular educational program for them. Furthermore, there must be provisions to involve them in income-generating activities; the government can start with their

quotas. The young people urged that if developing Human Resources is our prime concern, there is no way to build an inclusive society.

3.10 Ensuring Youth-friendly Health Facilities

Health requirements were analysed, and it was seen that most of the respondents wanted low cost/subsidised healthcare the most and then mental health, management and women-friendly environment were prioritised. 'Special needs' services were the least required. It seems that cost is the most critical factor for health services. It can be caused by the perception of the high cost of health care. Then, mental health facilities, gender neutrality and mismanagement are considered. This shows that there have been improvements in these areas.

The young people demanded youth-friendly health services, particularly for SRHR, which is still beyond the mainstream priorities. Both the adolescent and young men and women have queries regarding their sexual and reproductive health, which are not appropriately addressed by the family, teachers or even by the health service providers. They face troubles if they need to seek medical assistance regarding SRHR. Social taboos still prevail that unmarried people do not need to know much about these issues, but the reality is that they may have critical issues that should be considered, and it is their right to know about these. Unless they remain unaware of these, that may lead to confusion, dilemma and inappropriate decisions. Hence, a favourable and youth-friendly environment is needed so that young people can get their queries heard and answered.

The concern for Mental Health is still new to us. Developing special arrangements for psychological counselling is a burning need of the youth, proven through the reported cases of depression suicides. People nowadays are going through a very stressful life and they are really struggling to balance their responsibilities, relations and their own expectations. Consequently, they are falling deep in depression and in the worst cases going to commit suicide finding no other way. Hence, developing special arrangements for psychological counselling to prevent frustration and suicide is very much urgent. The young people suggested immediate initiatives regarding this.

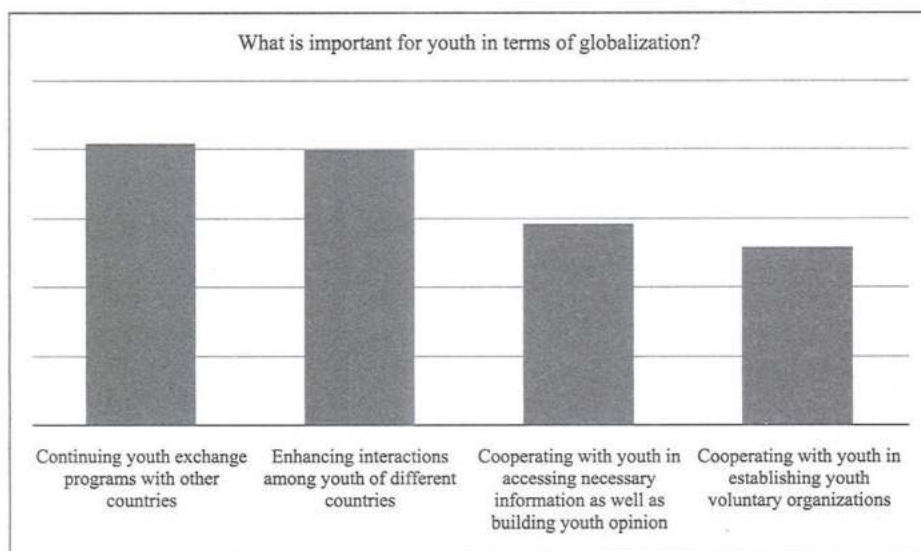
3.11 Globalisation

Globalisation aspects such as exchange programs, youth interactions among different countries, information sharing, and voluntary organisations were examined for their importance to youth society. Among the options, exchange programs were the most important, with a 30% response. Interactions with youth communities of other cultures are also similarly meaningful (29.5%). Among the other two options, voluntary organisations were thought to be the least important.

3.12 Providing Budget for Quality Research on Youth

The young people demanded to provide budgets for students and teachers at universities to conduct research on youth and organise regular learning sharing events involving youth. Regarding census and research, the Youth development index is the most important according to the youth.

Figure 7: Opinion regarding what is important for youth in terms of globalisation



4. Conclusions and Recommendations

Youth has always been a symbol of power and prosperity in human history. In the history of Bangladesh, youth has always played a crucial role in the social, political and development processes. Unfortunately, even though the country is now halfway to enjoying the demographic dividend, a comprehensive youth development action plan is yet to be made. In this regard, the present study gives an overall idea of the areas in which young people want to see immediate action. While doing this, the study also tries to identify specific recommendations that should be prioritised in the youth development action plan. The summary of these recommendations are stated below:

Throughout the discussions with the youth, the concern for quality education was the prime priority, and the youth recommended particular areas to be improved. They claimed for unitary education system merging all the categories like Bangla Medium, English Medium, Madrasa. When our urge to build an independent nation was to establish democracy, so many categorisations in basic

education were a sheer threat to it. Such a system not only prevails different ideologies among the students but also leads to broader discrepancies ranging from economic discrimination to social isolation to some extent. So, when we look forward to building an equitable society, the unitary education system must be in place.

To ensure quality education, we must involve qualified mentors, and we need to do whatever it needs. Firstly, we must admit that we still lack in offering attractive salary packages for the talented students we want to be involved in teaching. If we reform the salary structure, if the government invests more in it, the talented youth will join teaching at the very primary and secondary stages to foster quality education. At the same time, it would be a successful measure by the government to mitigate the unemployment problem. To encourage higher education, our government can subsidise education up to university as suggested by the youth. To minimise discrepancies and harmonise public and private education, the cost of the private universities must be consistent with that of public universities. When the students of private universities belong to well-off families, there are cases when many of them have to struggle a lot to manage the cost of not being able to get admitted at public universities. All such discrepancies must be abolished through proper intervention. If we do not count vocational education with due respect, many youths with vocational skills will remain unrecognised. Hence, there is no other way of patronising vocational education to ensure quality education and develop human resources. The youth being in the non-formal sector must be brought under the formal education system to extend the coverage. Initially, they need particular measures considering their present involvement in non-formal works. Mobile learning centres can be an option in this regard.

Providing sufficient job opportunities to the youth is the prior condition to produce economic dividend from the demographic dividend in every circumstance. Moreover, generating diversified jobs is the most effective way to do it. More job opportunities need to be created within the country. To minimise the pressure on the government jobs, there need more job positions and at the same time more scopes for the private sector. The young people have their innovative ideas, business plans and entrepreneurship skills and networks. The only thing they need is a youth-friendly environment that their ideas are appreciated. To make informed decisions, either in private/governmental jobs or entrepreneurship, the youth needs information, knowledge, skills and capacities. Moreover, hence a current and higher level of training opportunities must be open for the youth. In addition, this training should be accessible at a reasonable cost.

When young people are rich in modern ideas, the main hindrance towards taking any initiative is lack of money. Considering the strength of the youth, the government may arrange soft or collateral-free loans, particularly for the youth who may apply through their eligibility and plans instead of capital. Youth want sufficient and equitable arrangements for recreation and sports. They recommended different ideas to ensure inclusive measures for all the young people irrespective of gender, race, and physical condition throughout the country. Playground at every academic institution is of significant significance for youth for their sports and recreation purposes. There is an utmost demand from the youth for assurance of playground and recreation facilities at every academic institution from primary school to university in urban and rural settings.

In Bangladesh, Union Parishad (UP) is the most localised governing structure in the prevailing political system. So, the local government can quickly establish sports and recreation facilities at the UP complex. That will ensure more accessible facilities for youth for recreation and sports within their locality. Sports and recreation facilities should be women-friendly so that female youth and girls can participate without any hesitation and hindrances. Women friendly environment in sports can indeed lead to more and more achievements of female youth and girls. Around ten per cent (10%) of the total population in a given country are somehow challenged and developmentally disabled (physically-mentally) persons [World Health Organization]. So, it is imperative to adopt inclusionary measures for challenged persons to participate in sports and recreation activities. Many developing countries are setting an example of particular sports arrangements for physically challenged people. Undoubtedly Bangladesh is also taking special measures in different sectors, but there are still more scopes of improvement in sports and recreation. Like all other sectors of the country, corruption expanded in sports management as well. Corruption in sports associations takes various forms of nepotism, abuse, financial misappropriation, misconduct, sexual harassment. Youth recommended for complete eradication of all forms of corruption in sports association to encourage the genuinely talented and devoted sports persons. Youth identified tangible and sensitive discriminations in sports which are based on rural-urban identity. Addressing rural-urban discrimination in sports is highly important.

Youths need representation at all levels of the political system and decision-making structure. They deserve freedom of speech for nurturing democratic values and culture. In order to ensure a balanced society, it requires the representation of youth at all levels of the existing political system and decision-making process. A quota system can be introduced for nominating youth

candidates from all political parties in all forms of political contest. Youth need freedom of speech for nurturing democratic values. Political torture, extra-judicial killing and other threatening mechanisms might discourage youth from expressing their thoughts and demands. Youth should be accommodated in social services and civic activities to increase their participation and contribution everywhere. Increased youth participation in various social services and civic activities will make them more responsible and sensitised towards others. Youths have already proved their commitment towards others through initiating different movements. Such courageous steps by the youth must be appreciated, and more platforms need to be created for social activities by the youth. Youth should be added to different peace-promoting events to consolidate harmony and stability within society and the state. Youth can contribute a lot to preventing extremism and intolerance. Bangladesh is currently a country in transition in terms of economic indicators. In such a situation, the youth of the country should be brought forward to help eradicate poverty.

The promotion of ICT and awareness of opposing sides are equally important for youth. Measures should be taken to reinforce their real social life. Besides, restoring their family ties is also very important. In the contemporary age of ICT, the promotion of ICT for youth is essential. At the same time, building awareness on the wrong sides of ICT facilities is strongly recommended for youth.

ICT provides youth with a worldwide virtual society where any user lives a charming netizen life. At one stage, they feel boredom, frustration and disappointment. So, steps should be taken to reinforce and sustain the real social life of youth. Because of the attraction to virtual life, youth gradually create distance from parents and family members. Youth cannot find confidence in a fragile family bond. So, the necessary steps should be taken in order to restore and strengthen family ties for youth. There should be a balance between virtual-identity based life and family attachments for youth. Educating and admiring such a balance between ICT knowledge and family attachment can guarantee a useful virtual life along with healthy family life.

Drug cartels and supply networks must be abolished. In addition, proper rehabilitation and effective prevention mechanisms should be provided. Strict legislative measures and impartial implementation are also critical. All types of drug cartels, drug supply syndicates, and small and individual drug business networks must be eliminated at any cost. Most of the addicted persons are youth in terms of age group. Required actions must be taken for proper rehabilitation for already addicted people, especially youth. Often, in rehabilitation centres, youth get introduced to more dangerous drugs. So, a supervision mechanism must

be there in order to ensure check-and-balance in rehabilitation centres. Youth are most vulnerable to becoming victims of drug addiction. Prevention mechanisms should be everywhere, from family to the workplace; from school to university. Strict prohibition of drugs and other addiction materials can play an essential role in controlling drug addiction.

Youth should be assured of safe drinking water in salinity-prone areas. They should be assured of food-commodity safety as well. Besides, the significance of sustainable development must be recognised. Safe drinking water is just equal to life for those youth. Affordable, safe drinking water must be made available for the meaningful livelihood of youth. Nowadays, we often hear of arsenic contamination in food crops, melamine contamination in imported milk powder, and toxic chemicals in/on fruits. In such a situation, food security and food-commodity safety must be ensured. The significance of sustainable development must be acknowledged for the welfare purposes of youth. Strategies should be developed for youth to cope with climate change and global warming. Otherwise, a vast number of demographic dividends will remain lagged.

Equal support and opportunities for women, female youth and girls must be ensured for equitable development. It could be at the family level, at the society level, and state level. Besides, the behavioural approach and legal framework should conform with the principle of equal opportunities.

In Bangladesh, typically, a woman or a girl gets less support from the family. However, unfortunately, a man or boy gets much more support from the same family. That should be stopped. In a patriarchal society, women traditionally get limited support from the society level. As a consequence, women and girls get fewer opportunities from the society level for any initiative. Equal support and opportunities for women and girls at the society level must be ensured. In a family system and social system dominated by men, women are treated unequally in a state. Such inequality should be adequately addressed. As women and girls are not treated equally in almost every sphere, positive changes in the behavioural approach of all and legal frameworks should be introduced.

Many youths are somehow marginalised and underprivileged. For example, the youth of ethnic groups/ Adivasi; hijra, transgender and SOGI people; physically-mentally challenged persons; remote and rural areas. Righteous integration of all marginalised youth should be ensured. A significant number of youth of various ethnic groups/ advashi are somehow marginalised compared to Bengali youth. Righteous integration of youth of ethnic groups/ Adivasis must be ensured for effective and meaningful implementation of NYP. There are a small but negligible number of youths who are hijra, transgender and SOGI persons.

Righteous integration of hizra, transgender, and SOGI youth must be ensured for proper implementation of NYP. The number of physically-mentally challenged youth is constantly increasing. Alternatively, maybe, families are now admitting/recognising the very existence of physically-mentally challenged youth. However, they are not adequately integrated everywhere. So, righteous integration of physically-mentally challenged youth must be ensured. Youths in a large number are living in remote and far rural areas. They are just lagged in any consideration.

Moreover, lastly, many youths are a minority in terms of different indicators. Consequently, righteous integration of youth living in far rural and remote areas must be ensured in the implementation of NYP. Righteous integration of minority youth must be ensured.

SRHR facilities for youth must be ensured, and psychological counselling facilities must be arranged. Moreover, gender-neutral health facilities and a youth-friendly health management system should be created. Sometimes youth seriously feel that they need SRHR facilities. However, that many SRHR facilities are not available now. So, everywhere in the country, SRHR facilities for youth must be ensured. Expected/ demanded psychological counselling facilities are not available for youth. Psychological counselling facilities should be arranged and ensured for youth. Youth, specifically female youth and girls, often feel that gender-neutral health facilities are needed. In conformity with their expectation and needs, gender-neutral health facilities should be ensured. Whatever health facilities are available in Bangladesh that is not entirely youth-friendly, youth narrated. Youth want health management that will address and incorporate all needs and necessities of youth. So, a youth-friendly health management system should be created.

Globalisation renders many opportunity windows. Youth must be provided with opportunities for globalisation. International youth interactions and exchange programs should be facilitated. Updated knowledge from foreign countries should be available for youth. Moreover, youth should be trained for self-help and self-esteem. International youth interactions could be beneficial in this age of globalisation. So, international youth interactions must be encouraged. Youth exchange programs should be initiated. Youth exchange programs can enrich the knowledge, experience and skill of youth in both ways learning and disseminating. Youth should be provided with updated/ cutting-edge knowledge from foreign countries. Youth should be trained for confidence, self-help, and self-esteem. Then, the youth will emerge with leadership qualities. As a result, the entire society/ state will be the beneficiary.

There should be ample research on youth to identify their needs and recommend what to do for youth. So, a sufficient budget for quality research on youth should be allocated.

Budget/ funds should be allocated for students at universities to conduct diversified research on needs, expectations, and solutions. Funds should be available for faculty members/ professors at universities for quality research on youth.

Many independent/ freelancer researchers and experts are interested in researching youth. Budget/funds should be available for such researchers and experts to research findings on youth. NGOs can play a vital role by providing research initiatives on youth and their suggestions based on those researches. So, the budget should be allocated for NGOs for research on youth. Overall, regular learning sharing events must be organised for youth. That is how it is possible to nourish the efforts and initiatives for youth.

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Socioeconomic Analysis of Challenges Faced by Urban Working Women in Bangladesh: A Case Study of Rajshahi City Corporation Area

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Abstract

The number of working women is increasing day by day in Bangladesh, but simultaneously, different challenges are faced by women in their workplace, especially urban working women. The study's main objective is to discover the challenges urban working women face and determine the socio-economic factors that create challenges for working women. The study was confined to the urban working women in white collared jobs in Rajshahi, Bangladesh. A mixed-method approach and face-to-face interviews and questionnaire techniques, including both close-ended and open-ended questions, were chosen for effective elicitation of data from the respondents. The study was based on primary data collected from Rajshahi city. Different statistical tools and techniques like the chi square test, Phi and Cramers' V test were used to discuss the findings. The probit regression model has also been used to analyse the impact of socio-economic factors that create challenges for working women in their workplace. The study has shown that the respondent's age, occupation, duration of job, deviant workplace behavior, and child care facility are highly related to the challenges that a

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woman has to face in their workplace. This study also suggests that cooperative behavior from family and authority can reduce the challenges faced by working women in their workplace.

JEL Classification J14 · J16 · J62 · Z1 · C2

Keywords Women · Workplace Challenges · Mixed-Method · Probit Regression

Introduction

Women and work are the two most common words in the present society. Women in the workforce earning wages or salary are part of a modern phenomenon that developed simultaneously as the growth of paid employment for men, but women have been challenged by inequality in the workforce. The past two decades have seen a massive influx of women in the labour force, although there are significant variations from one region to another. Women continue to face numerous challenges in accessing the labour market. More often than not, they obtain jobs of a lesser quality than men's, they are discriminated against in the workplace, experience poor working conditions and job insecurity, and are vulnerable to abuse and exploitation. The challenging environment in which they work often results in less security in their post-professional life (Women and work, ILO, 2007). Moreover, there is no single solution to solve this situation entirely. Empowering women aims to inspire women with the courage to break free from the chains of limiting beliefs patterns and societal or religious conditioning that have traditionally kept women suppressed and unable to see their true beauty and power.

Bangladesh is a developing country where half of the total population is women whose socio-economic condition is deficient. Struggle for modernity, tradition, men-women equality, social dignity, security, and multilateral pressure, women's position in the family is very complex. Their economic activities are minimal due to inadequate opportunities and social constraints, including traditional practices discouraging women's employment outside the home. Many indoor and outdoor activities of women are not treated as work. The devaluation of women's labour in the labour market also hinders women's rights. However, in a market economy, the women of Bangladesh are constantly facing new challenges. Though women work in educational institutions, medical, factories, police, even in uneven areas, women are neglected, tortured, and persecuted even in uneven areas. In the society of gender disparity, it is difficult for women to stay parallel and enjoy the right of an equal participant. At present, women's empowerment has emerged as one of the significant development issues because this is the most effective tool for poverty reduction and sustainable development.

However, gender equality and the empowerment of women are now recognized in Bangladesh. According to the Bangladesh Bureau of Statistics, the population of women in Bangladesh has increased to 71933000 (in 2011) from 32400138 (in 1971), a dramatic increase in 40 years for the population. Also, in 2011 the number of females aged 15 and above in education was 72.65%, rising to 93.54% in 2016. The adult literacy rate for females (Higher education) has been increased by 69.9% (in 2016) from 46.74% (in 2011). Of the 106.1 million persons aged 15 years or older, 59.5 million (56.1 percent) were employed or engaged in economic activity; 17.8 million (33.2 percent) were females, and 79.4 percent were males. Again from 16.52 million employed populations in urban areas, 12.09 million were males, and 4.43 million were females.

Following the independence of Bangladesh in 1971, the country had four divisions: Chittagong Division, Dhaka Division, Khulna Division, and Division. Rajshahi Division is one of the eight first-level administrative divisions of Bangladesh. It has an area of 18,174.4 square kilometers (7,017.2 sq. mi)[2] and a population at the 2011 Census of 18,484,858.[3] Rajshahi Division consists of 8 districts, 70 Upazilas (the lower administrative tier) and 1,092 Unions (the lowest administrative tier). Rajshahi (nicknamed Silk City) is a metropolitan city in Bangladesh and a major urban, commercial and educational centre of North Bengal. The administrative district was established in 1772 and the municipal corporation in 1876. It was made a city corporation in 1991. It is the administrative seat of both the Rajshahi Division and the Rajshahi District. It is located on the north bank of the Padma River and near the Bangladesh-India border; the city has a population of over 763,952 residents. The city is surrounded by the satellite towns of Nowhata and Katakhal, which together build an urban agglomeration of about 1 million populations. The number of male population in Rajshahi district is 1,309,890 and female population is 1,285,307. The literacy rate in this district (7 years and above) is 53%, from which male is 55.8% and female is 50.1%. Again school attendance (5 to 24 years) rate is 58.9%, where the male is 61.8% and female is 55.9%. According to the census of 2011, the total number of employed persons in the Rajshahi district is 770,627, among which in agriculture 479,602; in industry 49,170 and service 241,855. In every sector, the number of males is greater than females. (Source: Bangladesh Bureau of Statistics (web)).

While a majority of the women still face discrimination and gender bias, in the last few decades, the number of women successful in politics, technology, and business is definitely on the rise. Society has started seeing women from a different perspective. They work as lawyers, nurses, doctors, social workers,

teachers, secretaries, managers, officers. There is no profession today where women are not employed. However, working women indeed have to face problems by their sex. For centuries women have been subjected to exploitation and torture, physically, sexually, and mentally. There are innumerable challenges and problems faced by them both at home and workplace.

Working women are essential for the development of society, so empowerment of women is essential to the process of upliftment of the economic, social, political status of women.

Literature Review

Shettar, M. R. (2015) analysed the issues and challenges of women empowerment in India based on secondary sources. The study reveals that women of India are relatively disempowered and enjoy a somewhat lower status than men despite many efforts undertaken by Government. That is, unequal gender norms by women are still prevailing in society. The study concludes by observing that access to Education, Employment, and Change in Social Structure are only the enabling factors to Women's Empowerment.

Safa, M. N. & Akter, T. (2015) took a survey of 100 female journalists, six in-depth interviews from media critics of Bangladesh, and used secondary data to find out the challenges that women journalists face in their professional environment. The study shows that 86% of respondents face challenges in the media houses, while 14 % of respondents mentioned that they did not face any challenges. Again 83% of female journalists face gender discrimination in their media houses, while 17 % of respondents mentioned that they have no experience with this. Participants urged the removal of gender imbalance in media and provided females with better wages and equal opportunities as enjoyed by men.

Sikdar, M. H., Sarkar, S. K., & Sadeka, S. (2014) depicted the socio-economic conditions of female garment workers from a survey of 80 female respondents from 10 garment factories of the Dhaka metropolitan area using simple statistical techniques. The authors marked some problems women employees face, like working without sitting, getting less wage, very rough and bad behavior to the workers, especially to the aged workers by supervisor and sometimes beaten up by line chief or supervisor. However, management claims that young workers are more productive than aged workers.

Zohurul, A., & Hasan, M. (2013), relying on both primary and secondary data from 150 respondents, carried out a study to find out the opportunities and challenges faced by the woman entrepreneurs of SMEs in Rajshahi. Their study shows that 34% of respondents lack practical experience and knowledge, 36 %

agreed that they need to go under religious misrepresentation, while 17.3% were neutral. 34.6% told family supports are not adequate, whereas 2.6% are satisfied. 37.3 % of women have capital deficiencies, while 5.3% have not. Again 41.3% of respondents have lack credit facilities, whereas 1.3% of respondents disagree. Their study gives some suggestions about removing barriers behind the development of women entrepreneurs SMEs in the Rajshahi area and fostering how they play a role through SMEs.

Kousalya, N., (2015) tried to deliver what incidents arise in the IT industry and how to face the situation by women employees from 200 samples in Chennai city. The primary data was collected using Likert's 5-point scale, and a random sampling method was also used. The study found that physical and psychological problems arising in the working hours and health problems like sleep difficulties and backaches are the significant difficulties they face. The researcher concluded with the implementation of health education, training of personnel to prevent and overcome the morbidity and psycho-socio problems.

Bavya, M.P., & Raghunandan M.V.(2018) conducted a study analysing the problems women face in the BPO sector and to understand the influence of education on women working in the BPO sector in Mysore city. They took 50 and used the reliability test, factor analysis, and one-way ANOVA test. The problems faced by the working women are hesitation, salary, insecurity, stress, gender discrimination, and family support. In these dimensions, "Hesitation" is the most critical problem faced by working women. Different education groups of working women did not have significant differences in the problems they were facing, indicating that working women had almost the same perception of the problems they were facing.

Salam, A. (2016) took 150 respondents, used quantitative and qualitative data collection methods, convenience-sampling technique, and online survey to study the challenges working women face in Al Ain city. The result showed that 30% of working women faced stereotypical challenges, and 25% faced challenges with childcare. They also faced challenges of balancing between work and home, sexual harassment, gender discrimination, and challenges related to transportation.

Chilipunde R. et al. (2013) focussed on the nature, organisational structure, and cultural barriers that affect Malawi women participation in the construction industry through quantitative research design where 50 respondents were both purposively and randomly sampled. Their study highlights five challenges that affect women's participation and progression in the industry: short maternity leave, balancing work and family problems, and sexual harassment. The

researchers recommended providing career guidance, undertaking awareness campaigns, monitoring workplaces, and reporting sexual harassment.

Rahman, S., Abd, et al. (2017) tried to study the challenges faced by working single mothers and the reasons for their non-participation in financial assistance programmes in Kuala Lumpur, Malaysia. Four working single mothers ranging in age from 40 to 67 were interviewed to gather in-depth information on the challenges and reasons, and they found financial constraints, time constraints, lack of knowledge and skills, social stigma, and lack of childcare facilities. Interventions are recommended for relevant authorities and agencies to increase the public's awareness and level of trust.

Tasnim, M. et al. (2017) conducted a study based on primary research where a sample of 40 female employees from different organizations was selected to find out the reasons creating work-life imbalance. According to their study, 38.5% of respondents often feel depressed, 37.5% of respondents experienced hypertension, 30% of respondents faced obesity problems, and 62.5% of women experienced frequent headaches due to excessive workload and long working hours. Women have suggested that management include work from home, flexible working hours, and providing a daycare facility.

Gowda, K., & Rao, P. (2018) looked at the role conflict situation of women based on an explorative study and random sampling method in the city of Bengaluru, India. They took an interview with 300 women. As per their study, women were found to have more significant problems in the workplace alone, which have more importance than child care and household responsibilities. Work-related problems are dominant in the context of gender discrimination in promotions, wages/salary, and work environment. Their paper calls for more comprehensive discussion across scholars to arrive at a global gender policy on new dimensions of Role conflict and gender.

Abid, A. et al. (2013) focused on the problems faced by working women in the Banking Sector of Bahawalpur. In their exploratory empirical research, data were collected by questionnaire from 300 respondents. The majority of the respondents agreed that married women face more problems than unmarried women in balancing their work and family life. Most of the respondents are satisfied with the salary structure, but they are not satisfied with the promotional system in the banking sector.

Educated urban women are presumed to be more aware of the opportunities and challenges of the workplace, or educated urban women can better understand their roles and limitations in the workplaces and are perceived to be bold enough to develop their personalities, with or without encouragement from their families.

An assessment of the problems and issues plaguing urban working women is therefore necessary for better understanding workplace dynamics related to women. There were some man-made boundaries for women during earlier days, but now women play vital roles in different sectors. Women today are breaking that boundary and are playing the dual role of balancing domestic life as well as professional life, giving a boost to their societal status in the process. The major problems for working women arise out of the dual responsibilities of the working woman - domestic work and office work. Though more and more women are coming out in search of paid employment and their families also need their income, the attitude towards women and their role in the family has not changed much. Women continue to be perceived as weak, inferior, and second-class citizens. Even today, looking after the family and children is generally perceived to be the man's primary responsibility.

From this point of view, the main objective of this study is

1. to find out the challenges of working women
2. to determine the socio-economic factors that create challenges for working women and
3. to find out the possible solution for reducing the challenges.

Data and Methodology

The study is exploratory and aims to identify the challenges faced by urban women in different professional sectors like public sector enterprises, banks, schools and colleges, hospitals, commercial organizations. The present study is mainly based on primary data with both quantitative and qualitative data support. Rajshahi City Corporation is selected as the study area for this research work. Data are collected randomly from 100 working women in Rajshahi City Corporation. The study surveyed only urban women employees in white collared jobs who have been in their jobs for at least six months. Purposive sampling is followed for this study. To analyse the challenges faced by urban women in different professionals, the sample is selected to cover all necessary data required for analysis. The survey was conducted from July to August 2018.

Research methodology refers to a systematic solution to the research problem considering the logic behind methods used by researchers in a study and why other methods are not used (Kothari, 2004).

One of the objectives of this paper is to use the survey data to look at socio-economic and demographic determinants that create challenges in their working place. Here to find out the impact of the cause and effect relationship between

different socio-economic variables and the challenges faced by working women, the following equation is formulated

$$P_i = f(X_i) \dots \dots (1)$$

P_i is challenges faced by urban working women, and X_i is a set of socio-economic, demographic, and farm factors that influence the challenges.

The U.S. Department of Labor, 2012 has defined the challenges of working women as Millions of women in the United States are more likely to live in poverty than men and still face significant barriers to economic security and stability, including occupational segregation; barriers to moving into higher-level positions; low wages and unequal pay; inadequate workplace flexibility; and pregnancy and sex discrimination. So, any woman who is facing one of the barriers is facing challenges in their workplace.

In this study, challenges faced by urban working women are a binary variable. Since the dependent variable is binary, a probit regression model is applied to estimate the impact of the socio-economic determinants. Probit model is also known as the normit model. Thus, it has two categories: challenges faced by urban working women = 1 and challenges not faced by urban working women = 0.

Here the probability of facing challenges of women in their working place can be expressed as

$$I_i = \beta_1 + \beta_2 X_i$$

Given the assumption of normality, the probability that I^*i is less than or equal to I_i can be computed from the standardized normal CDF as

$$P_i = P(Y=1|X) = P(I^*i \leq I_i) = P(Z_i \leq \beta_1 + \beta_2 X_i) = F(\beta_1 + \beta_2 X_i)$$

Where $P(Y=1|X)$ means the probability that an event occurs given the value(s) of the X , or explanatory, variable(s) and where Z_i is the standard normal variable, i.e., $Z \sim N(0, \sigma^2)$. F is the standard normal CDF, which written explicitly in the present context is:

$$\begin{aligned} F(I_i) &= \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{I_i} e^{-\frac{z^2}{2}} dz \\ &= \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\beta_1 + \beta_2 X_i} e^{-\frac{z^2}{2}} dz \end{aligned}$$

Since P represents the probability that an event will occur, the probability of owning a house is measured by the area of the standard normal curve from $-\infty$ to

ii. Now to obtain information on I_i , the utility index, as well as on β_1 and β_2 , we take the inverse of the equation to obtain:

$$\begin{aligned} I_i &= F^{-1}(I_i) = F^{-1}(P_i) \\ &= \beta_1 + \beta_2 X_i \end{aligned}$$

Where F^{-1} is the inverse of the normal CDF.

Results and Discussion

To investigate socio-economic determinants that create different types of difficulties for working women in urban areas, the methodology consisted of the following steps. We have collected both qualitative and quantitative data to find out the difficulties and show the impact of the socio-economic determinants on the difficulties. Primary data is collected with the support of a questionnaire. In the questionnaire, different questions were asked to the respondent, and the interviewer recorded the answers. We used this method because it is the most suitable method to get information by visiting respondents. In this case, we have done descriptive analysis to see the relationship between the variables and run the regression model to measure the impact of the variables.

Descriptive Analysis

To describe the challenges faced by the urban working women, the Department of Labor in the United States, 2012 stated that Women are still facing different types

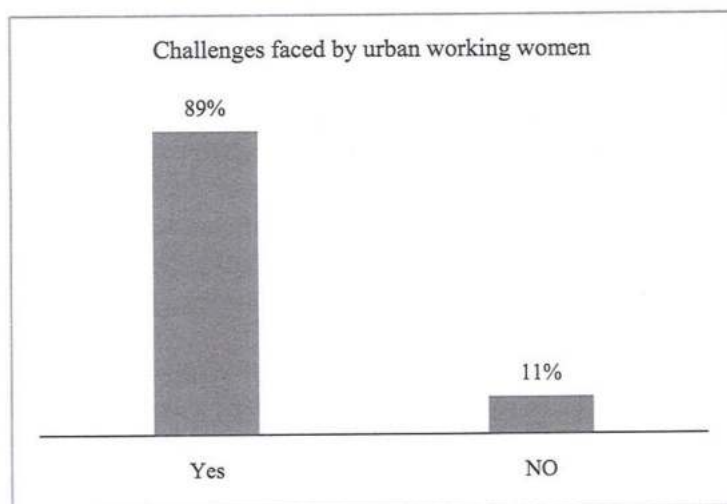


Figure 1: Challenges faced by urban working women

of barriers in their workplace, especially moving into higher-level positions; low wages and unequal pay; inadequate workplace flexibility; and pregnancy and sex discrimination. From this point of view, we have found that in Rajshahi city, 89% of women are facing different types of challenges and barriers in their workplace.

To explain the barriers and challenges, according to the Department of Labor in the United States, 2012, we have found that, among the 89% of women who are facing challenges, only 14% of total respondents mention that men are getting a faster promotion than female. As they are all white collared jobholders, their promotion rules are equal for all gender, and low wages and unequal pay are not applicable here.

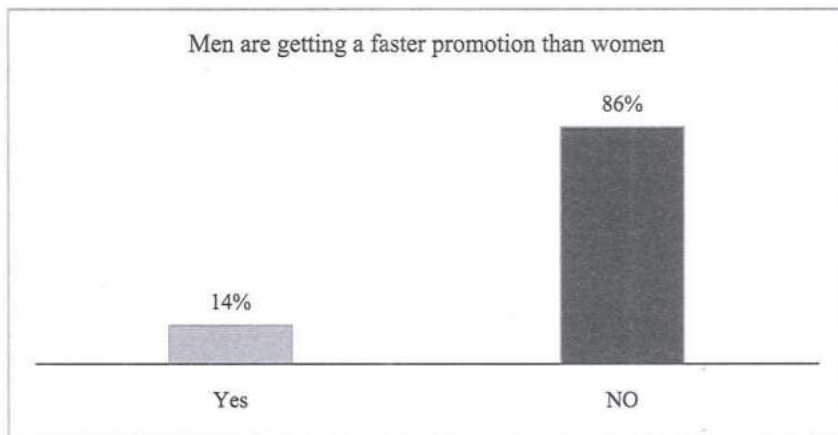


Figure 2: Men are getting a faster promotion than women

However, in the case of workplace flexibility, 66% of women said that they are suffering because of inadequate workplace flexibility. Moreover, because of this inadequate workplace flexibility, women face different kinds of difficulties at their workplace. Among them, 51% of women faced time management difficulties, 13% women faced the absence of emotional support difficulties, 11% women faced newly emerging family problem difficulties, 10% women faced physical stress and depression. Moreover, 5% of the total respondents are facing other kinds of difficulties.

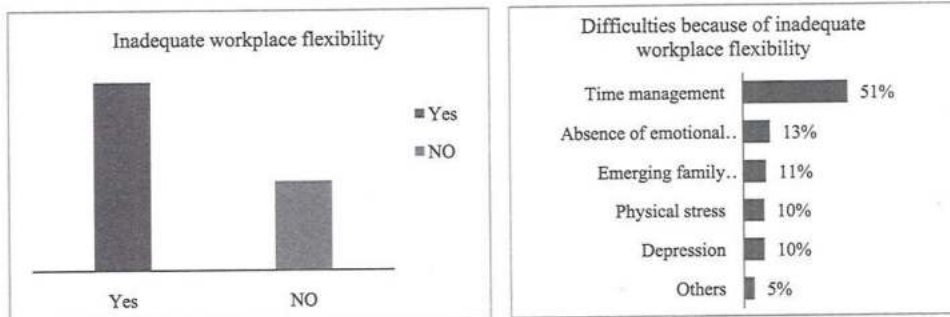


Figure 3: Inadequate workplace flexibility Figure 4: Difficulties because of inadequate workplace flexibility

In the case of pregnancy, 73% of women are facing various types of difficulties. In most cases, women are not getting enough support from their authorities. The facility for an emergency is not available in the workplace. Also, the post-delivery situation is not so good. The child care facility is also not available in the workplace, especially in Rajshahi city. According to the data, only 16% of total respondents enjoy this daycare facility, and 84% of our respondents are suffering, where 98% of women feel they need a daycare centre in their workplace.

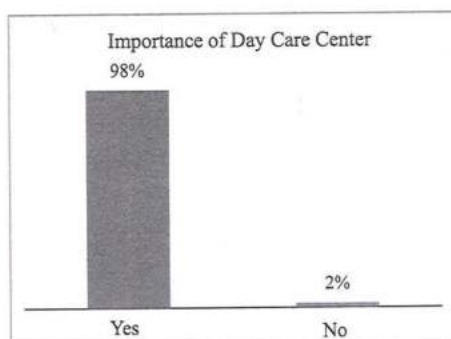


Figure 6: Importance of child care

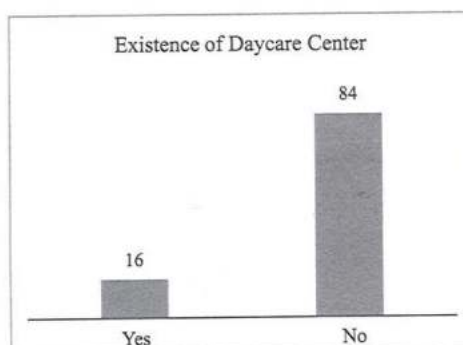


Figure 7: Existence of Daycare centre

The study shows that 33% of women think, availability of daycare facilities improves their working productivity, 26% think it offers their emotional security, 21% think it is convenient for their work and 11% of women think it creates good morals, and 9% worker express that daycare facility will help to retain and attract the employees.

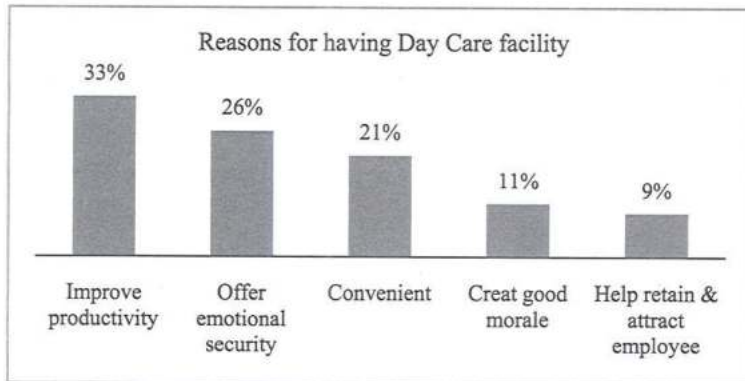


Figure 8: Reasons for having Day Care facility

Sex discrimination is a significant issue in our country. In the workplace, 72% of women face sex discrimination by their superior, peer, subordinate, and third party, which has specific effects. 93% of women said that this sex discrimination has a major effect on their life.

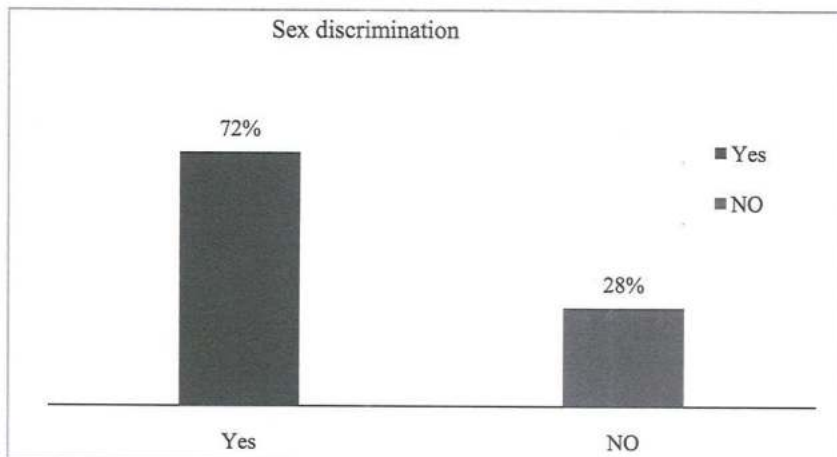


Figure 9: Sex discrimination

According to the study, half of the respondents are suffering from mental and physical stress. 29% of women are in depression because of sex discrimination in the workplace. 14% of working women are losing their confidence day by day. 5% of women cannot keep the proper balance between office and family, and 2% suffer from other problems.

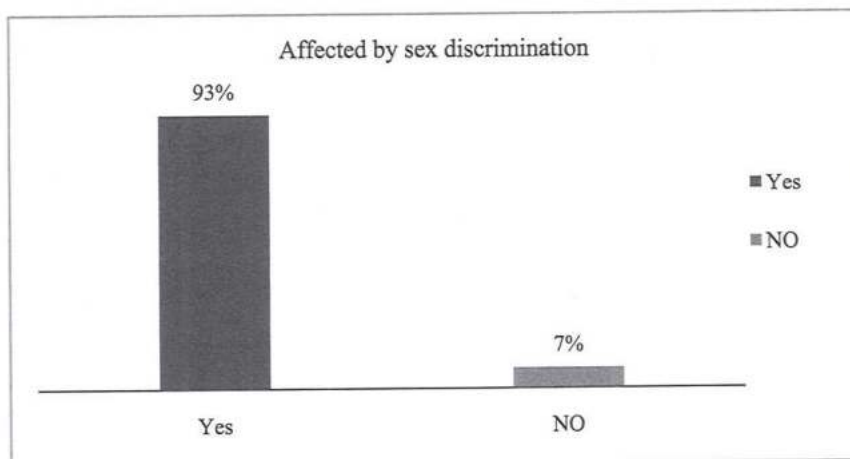


Figure 10: Affected by sex discrimination

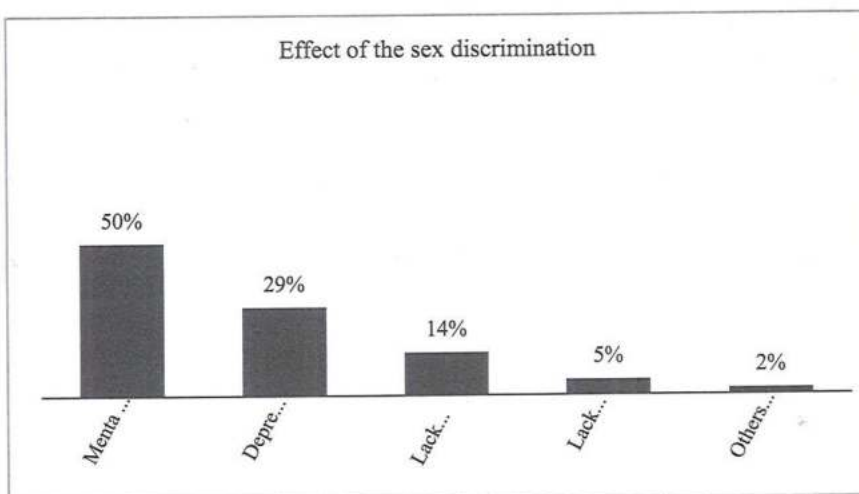


Figure 11: Effect of the sex discrimination

Also, to show the relationship between different variables and challenges faced by urban working women, we have done the Chi-Square test and Phi and Cramer's V test, and we have found the following data

The chi-squared test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. Phi and Cramer's V are based on adjusting chi-square significance to factor out the sample size. These measures do not lend themselves to straightforward interpretation. Phi and Cramer's V vary between 0 and 1.

Table 1: Chi-Square test and Phi and Cramer's V test

Name of the variable	Chi-Square	Phi and Cramer's V test
Age of the respondent	35.162***	.593***
Occupation of the respondent	3.343***	.183***
Marital status of the respondent	.256	.053
Status of having kids	7.311***	.308***
Number of Children	1.576	.126
Family support	28.815	.537
Duration of job	3.806	.195
Deviant work place behavior	3.500***	-.188***
Child care facility	1.128	-.107
Facility of security	.117	-.034

Source: Authors calculation

From the table, we have found that the respondent's age, occupation, the status of having kids, and deviant workplace behavior have a relationship to the challenges that women have to face in their workplace. We have found this variable at a 10% level of significance through the chi-square test. From Phi and Cramer's V test, it is examined that age of the respondent and status of having kids has a robust relationship with the challenges. Similarly, the respondent's occupations and deviant workplace behavior strongly correlate with the challenges they have faced in the workplace.

Probit Regression

Probit regression also called a probit model, is used to model dichotomous or binary outcome variables. In the probit model, the inverse standard normal distribution of the probability is modelled as a linear combination of the predictors.

From table 02, we have found that the respondent's age, occupation, duration of job, deviant workplace behavior, and child care facility are related to the challenges that a woman has to face in their workplace.

Here, the respondent's age and occupation are positively related to the different challenges that women are facing in their workplace. The probability of facing challenges increases with the growing ages. That means aged women are facing more challenges because with the ages, their energy for work decreases. Also, adaption and adjustment with new technology and new colleagues become more complex. In the case of the occupation of the respondent, we divided the whole respondent into two categories. We take occupation as a dummy variable because 42% of our total respondents are teachers, and 58% are doctors, bankers, and human resources. As there are several educational institutions in Rajshahi

Table 2: Probit Regression

Variables	Coefficient	Std. Err.	z	P>z
Age of the respondent	.217013*	.0619992	3.50	0.000
Occupation of the respondent	1.477269 **	.5514803	2.68	0.007
Marital Status of the respondent	.5304734	.7875021	0.67	0.501
Status of having kids	-.0137119	.9226594	-0.01	0.988
Number of Children	.237735	.4285675	0.55	0.579
Family support	.2985009	.756842	0.39	0.693
Duration of job	-.2509507 *	.0591564	-4.24	0.000
Deviant work place behavior	-1.614115*	.4772344	-3.38	0.001
Child care facility	-.8383854***	.4620685	-1.81	0.070
Facility of security	.6492824	.5584757	1.16	0.245
_constant	-4.408632	1.540376	-2.86	0.004
Probit regression				
Number of observation = 100				
Wald chi2(10) = 33.76				
Prob> chi2 = 0.0002				
Log pseudo likelihood = -23.267068				
Pseudo R2 = 0.3285				

Source: Authors own calculation

whose fame spread beyond the country's boundaries and abroad. Rajshahi city is also known as Shikshanagari for these renowned educational institutions. Also, diversified job opportunities are not available in Rajshahi city. So, we take 1 for teacher and 0 for other occupations.

Moreover, surprisingly we have found that the probabilities of facing teachers' challenges are higher than in other occupations. As a teacher, women have to deal with lots of students that is not an easy task. Also, teaching and research have to give a lot of time in their study, which creates many difficulties in their lives.

Duration of job, deviant workplace behavior, and Child care facility are adverse to the challenges. Duration of job can reduce the probability of facing challenges in the workplace. As with the experiences, they learn how to deal in the workplace, which is beneficial to the women to reduce the challenges. Deviant workplace behavior also helps to reduce the probability of facing challenges of the women. If the women get a proper environment and cooperative colleagues, the probability of facing challenges will reduce sharply. Lastly, the daycare centre in the office can reduce the probability of facing challenges. Availability of childcare facilities can improve their working productivity, offer emotional security, be convenient for their work and create good morale.

Marital status, having kids, Number of children, family support, and facility of security have no relation with the challenges that a woman faces in their workplace.

To facilitate interpretation of the estimation results presented in Table 03, the marginal effects of each variable on the predicted probability of facing challenges of the women in their workplace, evaluated at the means of the explanatory variables, are reported in Table 03. The marginal effects report of the Probit regression provides the probability that women will face challenges in their workplace. Moreover, data also provides the probability estimation for the likelihood of facing challenges in the workplace for the women given the statistically significant variables: age of the respondent, occupation of the respondent, family support, duration of the job, deviant workplace behavior, and child care facility.

Table 3: Marginal Value of Socio-economic Factors on Challenges Faced by Urban Working Women

variable	dy/dx	Std. Err.	z	P>z
Age of the respondent	.0159925 ***	.00876	1.83	0.068
Occupation of the respondent	.1081985 ***	.04773	2.27	0.023
Marital Status of the respondent	.0570428	.107	0.53	0.594
Status of having kids	-.0010036	-	-	-
Number of Children	.0175196	.03317	0.53	0.597
Family support	.0283855 ***	.04497	-2.21	0.027
Duration of job	-.0184935 ***	.00921	-2.01	0.045
Deviant work place behavior	-.0995756 ***	.04497	-2.21	0.027
Child care facility	-.0617838 ***	.03725	-1.66	0.097
Facility of security	.0670101	.08381	0.80	0.424
Probit regression				
Number of observations = 100				
Wald chi2(10) = 33.76				
Prob> chi2 = 0.0002				
Log pseudo likelihood = -23.267068				
Pseudo R2 = 0.3285				

Source: Authors calculation

The marginal effect report of the Probit regression in Table 03 indicates that if the age of the women increases, the probability of being faced challenges will increase .0159925%. The marginal effect also shows that if the women choose teaching as their occupation, challenges will increase .1081985%. If a women get more family support, the challenges increase .0283855%. This interpretation is a little bit tricky. In some cases, it has been found that family members' workload for the working women is in the name of family support. Suppose the duration of the job increases, the probability of being faced challenges will reduce -.0184935%. Likewise, if the women get deviant workplace behavior, the probability of facing challenges will reduce -.0995756 %. Finally, if the authority provides a daycare centre to the women, the probability of facing challenges will reduce -.0617838%.

Conclusion

Working women are contributing a lot to the economic growth of Bangladesh and a large part of economic activities are undertaken by women. Moreover, overwhelmingly, these working women faced a lot of challenges at their workplace. This research is conducted to explore the challenges faced by working women in Rajshahi city. In this study, we have tried to show the preliminary scenery of the society and define the challenges and different socio-economic variables that directly and indirectly involve the challenges of working women.

Due to the reluctance of respondents, enough time, and a meager budget, we faced tremendous obstacles to conducting the result. Further study is required and recommended to explore the other findings regarding this topic. The data from the questionnaire, interview of the respondents, and our practical observation reflect that challenges faced by working women have become a severe phenomenon in Rajshahi city. To reduce these challenges, a cooperative society is needed where family members and working authorizes will try to provide a comfortable and secure working environment with flexibility. Moreover, the availability of daycare centers can reduce the challenges.

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Engineers and Engineering Sciences in Development: Treatise of a Non-Engineer

Abul Barkat*

Abstract

The organisers of the 2020 Rajshahi Regional Seminar of the Bangladesh Economic Association have requested me – a student of economics – to deliver a Public Lecture that shall be of relevant interest to the Engineers. My Rajshahi University colleague, Professor Dr M. Moazzem Hossain Khan of the Department of Economics, insisted that I write a "thought-provoking" paper almost every other day. I gave much careful thought to the possible subject matter. Since this 2020 Rajshahi Regional Seminar of the Bangladesh Economic Association is an unusual joint venture with the Rajshahi University of Engineering and Technology's Faculty of Applied Science and Humanities – I thought it to be appropriate to write and talk about the possible role of Engineers and Engineering Sciences in facilitating development in the complex era of fourth&fifth industrial revolution within the orbit of globalisation.

The self-selecting idea of writing on the subject has been a difficult-to-accomplish task for me – a non-engineer. I tried to conceptualise, however, keeping the science of causality in mind.

After much thought into the logical links of the critical issues encompassing the theme, I contemplated it to be appropriate to respond to the following self-posed questions:

1. *Who is an engineer?*
 - *A designer and builder of an infrastructure?*
 - *A technology mover?*

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- *A development activist in a multidisciplinary team?*
 - *A pathfinder?*
 - *A thinker and doer of sustainable human well-being?*
2. *What is the development and developmental cooperation? Are these about*
- *Inter-country trade?*
 - *Sharing of knowledge and learning from each other (with people of other countries)?*
 - *Inter-country connectivity building?*
 - *Exploring each member countries' comparative advantage?*
 - *Maximise mutual benefit based on mutual trust and reciprocity?*
 - *A mechanism (ways and means) for ensuring accelerated sustainable development?*
3. *What role can engineers play in expediting meaningful development?*
- *Can play a role in isolation as technical personnel?*
 - *Can they play the role of a member of a multidisciplinary team?*
 - *Can play lead role?*

The treatise under discussion has two distinct dimensions, namely A. Development and Cooperation: Model, New Developmental State (NDS), and Developmental Regionalism, and B. Engineers as Prime Movers of Development and Cooperation. The presentation of these two dimensions under the "umbrella theme" might seem disjointed. It is so because, first, I wanted to put my thoughts on the essence of various dimensions of development and cooperation (irrespective of the role of any specific discipline including the engineers) encompassing, among others, issues and concepts of development model, New Development State (NDS), and developmental regionalism (with relevant lessons learned). Second, after setting the conceptual stage for development and cooperation, I have attempted to place the engineers and engineering sciences as lead agents and prime movers of development and cooperation for a "second nature-based" new industrial revolution¹.

Finally, I have concluded that an engineer is not just a technical person (expert), and engineers can be development leaders. However, to become the

¹ A major part of this paper is drawn from author's keynote paper titled "Role of Engineers in Development and Regional Cooperation: Thoughts of a non-Engineer" presented at National Seminar of the 53rd Convention of The Institution of Engineers, Bangladesh (IEB) on 15 January 2012. However, in this paper, I have made some major revisions and included some new analyses.

"leader of development cooperation", a paradigm shift in engineers' thought process is necessary.

JEL Classification B31 · A11 · O2 · P48

Keywords Development · Development Myth · Developmental State · New Development State · Developmental Regionalism · Engineers in Development · Multidisciplinarity in Engineering Science · Redesigning Engineering Education · Engineers and Engineering Sciences in Development · Fourth and Fifth Industrial Revolution · The Science of Causality.

A. Development and cooperation: model; new development state; developmental regionalism

A.1 Development Model of Developing Countries: The Essence

Traditionally economists are tempted to understand and/or define development in increased Gross Domestic Product (GDP) and/or in high economic growth rate and assume that the benefit of such growth will trickle down. Contemporary economists also suffer from many "development myths": *"Today's wealthy countries achieved success through a steadfast commitment to the free market". "Neoliberalism works"; "Neoliberal globalisation cannot and should not be stopped"; "The neoliberal American Model of capitalism represents the ideal that all developing countries should seek to replicate"; "The East Asian model is idiosyncratic, the Anglo-American model is universal", "Developing countries need the discipline provided by international institutions and by politically independent domestic policymaking institutions".* All these myths have been explored and logically refuted by Ha-Joon Chang and Ilene Grabel.² Therefore, as social thinkers, we first need to clarify the essence of 'development'. In this connection, I think the following would be the best guide to follow:

1. Development is not purely an economic phenomenon but a multidimensional process involving reorganisation and reorientation of an entire economic and social system (as proposed by Michael Paul Todaro).
2. Development is about transforming people's lives, not just transforming economies (as proposed by Joseph E. Stiglitz).
3. Development is about expanding human freedom; freedom is the primary goal of development, and freedom is also the principal development means. Development is the enhancement of freedoms that allow people to lead lives they have reason to live (as proposed by Amartya Sen).

² Chang, Ha-Joon & I. Gabriel (2005). *Reclaiming Development: An Alternative Economic Policy Manual*. London: Zed Books.

Since 2000, most developing countries (DCs) have pursued Poverty Reduction Strategy Papers (PRSPs) as a policy framework to ensure and attract official development assistance (ODA) and promote development. However, in general, their implicit development strategy has been a close integration with the global economy through removing trade barriers, the liberalisation and deregulation of domestic financial markets, and increased aid-financed social expenditure to achieve the Millennium Development Goals (MDGs). The outcome was *growth in the gross domestic product (GDP) with little structural transformation*. Poverty rates, measured using 'crude' and 'linear' definitions, have been falling but only slowly, as insufficient productive and decent employment opportunities have been created for the rapidly growing population. As a result, the number of people in multidimensional poverty increased.

The global financial crisis and recession further exposed the weaknesses of this development model. It revealed the risks, uncertainties, and vulnerabilities of integration with the global economy dominated by the so-called financialisation of the real economy. Most developing countries (DCs) experienced a sharp slowdown, with a decline in real per capita GDP. Although growth has subsequently recovered, it is clear that new development paths are now required for sustainable and more inclusive growth, which meets the immense challenge of productively employing the millions of young people – new entrants to the labour market. New development paths are required to address the issue of rising inequality and the destructive power of innovation.

Without any ambiguity, I believe that the opportunity for rapid poverty reduction through the development of productive capacities and the associated expansion of productive employment is real and significant. It can emerge from (a) mobilising underutilised resources, as well as the addition of new capacity through investment in agricultural productivity, plant and equipment; (b) the diffusion of available technologies; (c) public spending on infrastructure, skills and capabilities; (d) increasing public spending on education, health and social security; and (e) the creation of new 'useful' products and markets. There is, however, no unique way to combine these elements into a single correct strategy for inclusive growth. Notwithstanding, there is ample historical evidence that a cohesive, robust, catalytic and effective State responsive to the needs of its constituents is one of the prerequisites for defining the content of a long-term development strategy suitable to discovering what works in a particular context of individual countries. Although finding out a single correct strategy may be futile, it is absolutely an excellent guide to keep in mind that "*A good economic policy is a policy whose long-term social benefit is positive*".

The modalities, role and reach of the State in national economic management have tended to fluctuate over time. However, in all dynamic developing economies and all countries now classified as developed market economies, the government has played an immense role in promoting and supporting economic development. From this standpoint, it is time to talk about a *New Developmental State* (NDS). This NDS traces its intellectual origins to the Structuralist school and the East Asian developmental state. It focuses on creating new productive capacities rather than "reallocating" given resources and putting given productive capacities to more efficient use.

One-size-fits-all will not work. Each NDS will need to choose the trajectory of development suited for its economy, ranging from the traditional path toward "modernity" through Rostow's well-established stages of growth, including industrialisation via textile and garments and other labour-intensive commodities, toward technological leapfrogging into services or skill-intensive capital goods. The NDSs must identify and promote the type of industrialisation which is best suited for the particular country. This type of search makes up a vital component of the new functions of the NDS and requires policy space. Rather than taking industrialisation as a given trajectory for all DCs, the NDS "searches" (tries, experiments pragmatically) for the optimal development path in its own economy, including choosing the optimal form of productive and development trajectories.

The NDS approach is more holistic and integrated, encompassing both economic and social development, and needs to ensure that such development is served by finance rather than the other way around. The internal and external conditions that existed in East Asia in the 1950s and 1960s no longer exist.

At the early stages of development, the initiatives of the NDS will not rely solely on market forces to generate the desired structural change and economic transformation. In order to accelerate growth, the NDS will need to carry out significant shifting and reallocating of national and possibly international assets and resources to the growth-enhancing sectors. For this purpose, the new developmental State in DCs should engage in a more strategic type of integration into the global economy that would enable these countries to integrate in a manner that is in their interest to do so, rather than pursuing rapid trade liberalisation based on current and given comparative advantage.

Rather than arguing that DCs should integrate with the world economy and produce according to their static comparative advantage, the analytical foundation behind the NDS is associated with the classical economic perspective, which claims that productive structure is not endogenous to the countries' endowment structure (in terms of its relative abundance of labour, skills, capital or natural

resources). However, that comparative advantage is very much influenced and co-determined by interactions between the internal and external environment in which it operates. While the mainstream model of the State is underpinned by the paradigm of free trade and free capital movements as being the optimal strategy for the world economy, the analytical underpinnings of the NDS define their optimal degree of openness, implying that structural changes arise from shifts in the world economy, over which most developing countries have not much influence.

The NDS model is thus underpinned by the theory of openness within a managed trade policy that may enable a country to concentrate its relatively scarce resources in areas of production where world demand is highly income- and price-elastic; additionally, from this analytical perspective, it needs to promote the diffusion of knowledge of the kind of learning needed for continuous upgrading of the quality of all of the local factors of production.

The success of the NDS will depend on good development governance or, in particular, the capacity to achieve and sustain high rates of investment and to implement policies that encourage the acquisition and learning of new technologies. In all cases, the allocation of public investment is the primary function of the NDS, along with the setting up of a pro-investment regulatory framework that would enable rapid catch-up growth that could accelerate economic development. Moreover, the State needs legitimacy and a genuinely representative State, which will largely depend on the State's legitimacy to ensure a consensus for the development drive. It is a question of political will that involves "development contracts" or a social consensus in support of the development drive. A further critical governance capacity is the ability to absorb external shocks.

The nature of the relationship between growth strategies and governance capabilities varies widely amongst countries, including the composition and the nature of the State itself. While certain conditions may work very well in some countries, they may not work well in others.

In pursuing *real development*, it is crucial to recognise the *capability traps* of many governments and organs of the State. Capability traps holding many governments back are related to *isomorphic mimicry* where governments copy best practice solutions from other countries that make them look more capable even if they are not more capable and premature load bearing where governments adopt new mechanisms that they cannot do work, given weak extant capacities. (Therefore) "Importing "best practices" and placing unrealistic expectations on

the presumption that the level of performance and pace of change achieved elsewhere is possible everywhere, including "here", is a temptation".³

A.2 Development Cooperation towards Building New Developmental State

The benefits of cooperation (regional, South-South, North-South) will be most incredible when a dynamic relationship is established in which policies carried out by NDSs and cooperation reinforce each other in a continual process of change and development. In such a dynamic relationship, regional cooperation supports the building of the NDS and the achievement of its objectives. The NDS in DCs, in turn, enhances and shapes the benefits of cooperation.

Domestic ownership and leadership of policies is a *sine qua non* for enhancing the development benefits of any development cooperation, whether North-South or South-South. Mainstreaming South-South cooperation, both interregional and intraregional, into the national development strategies is thus a necessary condition to ensure that South-South cooperation promotes rather than hinders the achievement of the development goals.

It is clear that, with current policies, globalisation has not fostered the desirable kind of structural change in DCs that could pull labour from less to more productive activities. An NDS would seek to use development cooperation to reshape its integration into the global economy to enable the structural transformations necessary for creating decent and productive employment opportunities and achieving substantial poverty reduction..

Two central objectives of the NDS should be to promote learning and enhance resilience. Openness works positively only if the phenomenon of learning is suitably institutionalised on the policy side, involving appropriate government interventions that would make the domestic economy more responsive to change. In general, managed development cooperation can facilitate openness and learning in a far more rational and efficient way than the unmanaged global market. Developing countries should seek to capitalise on this.

Intensifying integration is also likely to be a valuable strategy because of the diversification of markets. Investment sources enable greater resilience. The differential responses of DCs during global recessions in the past demonstrated how strategic Southern integration could affect volatility. Those DCs relying more on regional markets were buffered somewhat from the sharp downturn in Northern markets.

³ Andrews, Matt., Lant Pritchett and Michael Woolcock (2017). *Building State Capability: Evidence, Analysis, Action*. UK: Oxford University Press (p.54)

There are several benefits which developing countries (DCs) can gain from regional cooperation. First, most of the DCs lack a sufficiently large and diverse home market (that could allow diversification of the industrial structure), and thus regional markets provide an essential economic space within which learning over time can take place. Second, there are significant opportunities for achieving economies of scale by providing various kinds of regional public goods that would benefit developing countries within regional groupings. Such regional public goods include various kinds of physical infrastructures supporting transport, communications and energy, regional science and technology infrastructure, and regional innovation systems.

In addition, regarding the agricultural constraints to development in DCs, reflected in their inability to generate surplus and guarantee food security for all, joint adaptive research with neighbouring countries, regional storage facilities, and coordinated investment programmes at the regional level can all make a difference. Moreover, 'financial deepening' can also have a strong regional dimension.

It is possible to identify several reasons. Southern partners may be motivated to engage in cooperation and mutual advantages obtained with DCS.

Firstly, there is a potential to create mutually beneficial market gains and opportunities for both partners.

Secondly, DCs offer access to natural resources which their Southern partners need.

Thirdly, regional prosperity and regional stability cannot be achieved without all the countries in the region.

Fourthly, the DCS can work jointly with Southern partners to articulate their familiar voice and exercise their collective influence in all forums.

A.3 Cooperation as Developmental Regionalism: Integration beyond Liberalisation

Developmental regionalism can be understood as a development-led regionalism that accepts globalisation as a historical trend but rejects the market-led approach to globalisation. Developmental regionalism aims to maximise the benefits of regional cooperation to achieve an advantageous insertion of the members' economies into world markets. This goal is not an end by itself but only a means to accelerate economic, social and human development.

Developmental regionalism is concerned with both the (a) internal economic development and domestic integration, while at the same time, with (b) strategic

integration of the regional trading blocs into the world economy. Developmental regionalism involves domains such as trade, variety of policy tools, and not only those traditionally associated with trading policies proper from tariff and non-tariff barriers, to subsidies, concessional loans, direct provision of infrastructure and other public goods, promotion of research and development and science and technology activities, State-owned enterprises and State-controlled mixed enterprises, and many others.

In tandem with its holistic vision of development, regional trade can also be promoted through the coordination of investment in strategic areas such as regional transport and other ancillary infrastructure. Prioritising investment in strategic areas of common interest and constraints can help overcome the pre-existing bias against regional cooperation (including trade). As many developing countries are better connected to other continents than neighbouring countries, they cannot fully benefit from the potential gains of regional integration. The promotion of developmental regionalism should strengthen the structures, institutions, capabilities typical of the developmental State at the national level.

This kind of developmental regionalism aims to foster industrialisation and accelerate the economic and social development of member countries as goals per se and as a means of successfully integrating their economies in the global web of market relations. In the context of globalisation, new developmental regionalism strives to exploit the maximum benefits that can stem from negotiating with other blocks and economic powers from a position of relative strength, such as the one allowed by member States collective ability to act as a single player. The expanded regional market generated through inter-State cooperation and temporary protection policies for domestic capital contributes to secure benefits for domestic firms over their foreign competitors. Developmental regionalism assumes the need for gradual and sequenced trade liberalisation and conscious and planned policy actions enacted to build up productive capacities. Such productive capacities are seen as a necessary condition that will eventually enable domestic businesses to participate in the global market.

In most developing countries, the experience of developmental regionalism is still in its embryonic stage. African countries, supported by the AFDB and the NEPAD and other partners, are embarking on similar initiatives to create development corridors and redress long-standing infrastructural gaps. Although, in general, these initiatives are at a more incipient stage than those in the Asian region, notable examples are The North-South corridor, which connects Durban and Dar Es Salaam, and the Maputo corridor linking South Africa's northern and eastern regions to the port of Maputo. So far, the most successful examples of its practical realisation can be found in Asia. Indeed, the region where these

processes are most advanced in East Asia is a region where a positive, proactive view of integration has prevailed for a long time. Here are some examples:

First, the recent experience of trilateral economic cooperation between China, the Republic of Korea and Japan constitutes a successful example of developmental regionalism. Trilateral cooperation in North-east Asia began in 2000 and has been focusing mainly on environment protection, transport and logistics, finance, and research and development. In the manufacturing area, particular attention was devoted to the IT sector. The latter covered several areas, from telecom service policy to network and information security. However, the main strategic goal was the joint development of new technologies such as next-generation Internet, open-source software, and radio frequency identification (RFID) sensor networks. The three North-east Asian countries were aware of the critical role of IT for overall economic upgrading and industrial competitiveness. The countries representing this trilateral cooperation adopted proactive government commitments to generate synergistic effects in technological development and, more broadly, enhance their firms' international competitiveness.

Second, the Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) is one of the sub-regional "growth polygons" that were established since the early 1990s to foster the process of regional integration among the member states of the Association of Southeast Asian Nations (ASEAN). As these sub-regional zones include impoverished countries, they face significant challenges. The BIMP-EAGA has tried to overcome these challenges by adopting the principles of developmental regionalism, promoting activities to enhance the economic capacity and prospects of lesser-developed countries to foster their integration into the regional economy.

Third, The Greater Mekong Sub-region (GMS) Program (ADB coordinated) can be a successful example of developmental regionalism. The GMS started in 1992, involves all the prominent actors around the Greater Mekong area, such as Thailand, China, and all the LDCs, ASEAN and ASEAN's development partners, including Japan. It is the only regional cooperation programme specifically targeting all LDCs in the region. The core of GMS is to enhance the infrastructure of industrial development in the region by implementing programmes in transport, telecommunications, energy, tourism, trade facilitation, investment, human resource development and agriculture. The basic strategy is to attract private investment to the region and facilitate cross-border trade, investment and tourism by strengthening infrastructure linkages. To enhance transportation linkage over the region covering three East Asian LDCs- Thailand, Viet Nam and Yunnan Province, and Guangxi Zhuang Autonomous Region of the PRC, the GMS programme introduced three economic corridor projects. These are (a) the

East-West Economic Corridor (Myanmar, Thailand, the Lao PDR, and Viet Nam); (b) the North-South Economic Corridor (China -Yunnan, Guangxi, the Lao PDR, Thailand, Viet Nam and Myanmar); and (c) the Southern Economic Corridor (Cambodia, Thailand and Viet Nam).

Fourth, China's *One Belt One Road (OBOR or yi dai yi lu)* initiative is the most talked-about mega-scale example of developmental regionalism having geo-economics and geo-strategic implications. OBOR intends to connect more than two-thirds of the world population and open up the windows for the revival of global business and infrastructural development across countries. Arguably, OBOR is one of the most extensive development plans in modern history. Under the OBOR initiative, China intends to build massive infrastructure with pipelines and ports in Pakistan, bridges in Bangladesh and railways to Russia, aiming to re-createthe "Modern Silk Road" trading route that may kick start the new era in globalisation. OBOR has implications for expanding the renminbi (RMB) internationalisation, both in the real economies of Belt and Road host countries and in the London offshore financial market. OBOR initiative intends to connect two ends of Eurasia, as well as Africa and Oceania, along two routes – one overland corridor (the "belt") and one maritime shipping lane (the "road"). Under OBOR, China plans to construct projects in more than 70 countries along these routes. The Belt and Road initiative is expected to cost more than one trillion US dollars.

Globally, many debates are already in place about the possible causes and consequences of China's Belt and Road initiative: Is it to resolve the issue of managing China's excess surplus? Is it to promote China's hinterland? Is it a state-backed campaign for China's global dominance? Is it an aggressive stimulus package for a slowing economy? Is it a massive campaign for Chinese investment around the world? Is it to ensure China's dominance in the construction sector at the expense of local contractors in partner countries? Will this initiative increases the risk of debt distress in many countries? Will this make China the most prominent foreign creditor? Is this a part of "*debt-trap diplomacy*"? Will this initiative block sea trade or monopolise sea trade by China? Will this act as dual-use for commercial and military purposes? China will use this as a vehicle to write new rules, establish institutions that will reflect Chinese interests, and re-shape 'soft' infrastructure? The argument I have raised entirely is simple: Economic dominance accompanied by huge moral hazards can be dangerous!

a. Engineers as prime movers of development and cooperation

Now, before I enter into the complex domain of "Role of Engineers and Engineering Sciences in Development", let me –make a meaningful link between

what has been said above and what I want to say now – recapitulate the first broad dimension on "development and cooperation". First, I tried to argue that the one-size-fits-all type of traditional development model has failed to respond to the needs of sustainable human(e) development through meeting the challenge of productive employment of millions of young people and addressing the risks and vulnerabilities of integration with the global economy dominated by so-called financialisation of the real economy. This traditional model has generated slow growth in GDP without any structural transformation. Second, a new model termed "New Development State" (NDS) has been proposed in addressing the first issue. The development under NDS must be able to reorganise and reorient the entire economic and social system, transform not just economies but the lives of people, and expand human freedom. The NDS, based on the knowledge economy, focuses on creating new productive capacities (in which engineer's/engineering science has a vital role to play) rather than "reallocating" given resources and putting given productive capacities to more efficient use. This model encompasses openness with managed development policy, diffusion of knowledge and learning needed to upgrade the quality of all local factors of production, good development governance, 'search for the optimal path of development in specific economy, and alike. Third, Development regionalism is essential, which accepts globalisation as a historical trend but rejects the market-led approach to globalisation.

B.1 What is the Contribution of Engineering Science to Modern Life?

Engineering science has played a critical role in improving human quality of life in the last 50 years by developing better water supplies, sewer systems, wastewater treatment plants, designing buildings to protect us from natural hazards and provide health care, improving agriculture through water resource development and distribution projects, dramatically improving transportation systems.

The engineers whose work has helped reduce the death rate dramatically, which is one of the principal reasons the population has grown so dramatically in the last 150 years. For example, transportation improvements alone have enabled rapid migration of large numbers of people worldwide and increased the volume of raw materials and finished products in international trade 1000 times in the last century. Economic output has increased over 30 times, fossil fuel 40 times and industrial production 150 times in the last century. Some undesirable environmental, health and social impacts have come along with this growth, particularly in the last half-century.

b.2 A new human perspective is needed

In the last five decades, the world population has been more than doubled to 7.7 billion people, and the world's economic output has increased fivefold. This unprecedented growth is altering the face of the Earth and the composition of the atmosphere. Pollution of air and water, accumulation of wastes, destruction of forests, erosion of soils, depletion of fisheries, and damage to the stratospheric ozone layer threaten the survival of humans and thousands of other living species. Humans are conducting an uncontrolled experiment unprecedented in scope and scale that represents the reversal of natural evolution which produced clean air and water and increasingly complex and diverse ecosystems -- systems that made human evolution possible.

These changes – a result of unsustainable and inequitable production and consumption patterns – are likely to accelerate with the addition of 80 million people to the planet each year. We are – a society living off its natural capital, not its income. We are acting like a planet in liquidation – a bad business. Recognising that these trends placed humankind at a crucial crossroads, scientists around the globe, including 102 Nobel laureates, signed the World Scientists' Warning to Humanity (in 1992). The warning reads as follows:

We, the undersigned, senior members of the world's scientific community, hereby warn humanity of what lies ahead. A significant change in our stewardship of the Earth and its life is required if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated.

Despite these warnings, the entire Earth's living systems have continued to decline. Moreover, the degradation of natural systems is likely to accelerate with the addition of 80 million people to the planet each year unless strategies to meet human needs are made more sustainable and just. The fact is simple is that the current strategies to meet human needs are not sustainable.

It is appalling that eighty percent of the world's resources are consumed by 20% of its population. The world's poorest 20% earn 1.2 percent of the world's income. The income ratio of the wealthiest 20% to the poorest 20% was 28:1 in 1960; it was 192:1 in 2018. For 40% of the world's population, poor sanitation, malnutrition, and air pollution are still significant causes of illness and death. The rural poor will migrate and be transformed into an urban poor, and environmental health and social problems will multiply. For the first time in history, more people are now living in urban than in rural areas. Moreover, this urbanisation is nothing but slumization in the absence of concomitant industrialisation.

In the USA, air pollution is believed to kill more people than automobile accidents – more than 70,000 premature deaths per year, according to the EPA. By the time population growth stabilises this century, a five- to sevenfold increase in

energy consumption and goods will be needed to raise the consumption level in the developing world to that in the industrialised world. Agricultural production must increase threefold in the next forty years for all humans to have adequate nutrition – we are already appropriating the most productive 40% of the land-based biomass for human purposes. Simply to maintain the current unhealthy levels of pollution and waste loadings will require an 80-90% reduction in pollution generated per unit of economic output. It cannot be achieved by building more waste treatment plants or air pollution control devices.

The world will need an unprecedented two billion jobs in the next twenty to thirty years to employ the current 1 billion underemployed and unemployed people and the new job seekers who will enter the market. It cannot be done with economic activity that substitutes capital for labour, consumes large amounts of materials and energy and creates large volumes of pollution and waste. Paul Hawken points out that with a sextupling of population and increasing economic output over 100-fold, we have the reverse of the situation at the start of the industrial revolution, which was an abundance of natural resources and the ability of the biosphere to assimilate wastes. "Our thinking is backward: we should not use more of what we have less of (natural capital) to use less of what we have more of (people)."

There is increasing social and political instability worldwide despite the end of the Cold War and the increased globalisation of the economy (which the globaphobes argue contributes to the instability). According to UNCHR, there are 71 million refugees, 47 million environmental refugees, unprecedented migration from East to West and South to North, 74 regional military conflicts. The UN has seen its influence erode, and there is increased isolationism of significant powerhouses.

Apollo 13 said, "Houston, we have a problem!" – a societal problem caused by the "design" of an economic and social system that lives off its support system in a degrading, unhealthy and unsustainable manner. We will need a paradigm shift in the relationship of humans to the environment and each other – one in which humans live in harmony with both natural systems and each other. We cannot achieve these results with our current thinking.

As Einstein observed, "the significant problems we face cannot be solved at the same level of thinking we were at when we created them." In the next twenty to forty years, society must adopt new strategies that allow the needs of an expanding population to be met in an environmentally sustainable and equitable manner. However, our response to the situation so far has been irresponsible and dangerously inadequate. For example, based on the so-called cost-benefit analysis

of carbon emission, we recommend taxing carbon and giving a message to firms emitting carbon and contributing to climate change is OK as long as you pay a fee: This is immoral; it simply legitimises pollution.

The current *growth ideology* has captured our imagination to the degree that we believe that more of the same resource-intensive and pollution creating economic growth remains the best way to serve the common good. Economists' idea of *growth at any cost* is primarily an outcome of their intellectual failure to value things with high value or many intrinsic values. Examples include failure in putting appropriate economic, social, cultural, political and intergenerational values of consequences of climate change, of (rising) inequality, of inadequate sanitation, of non-portable water, of work absenteeism, of school dropout, of not immunising a child, of deaths and disabilities due to preventable causes, of crime prevention, of not getting a fair price (by the farmers), of construction of dams or irrigation system ignoring the value of social capital (ultimately a "lose-lose" scenario), of indiscriminate use of energy and fuel, of unjust trade in the era of globalisation.

We have known that a healthy environment is essential to human existence, health, and well-being for quite some time. Humans can live for about four minutes without air, four days without water, and four weeks without food. Plants, animals, and the habitats they occupy provide the food that sustains human life. The Earth and all its living organisms supply all raw materials for human activities. All economic, social, and community systems derive resources from and are a part of the biophysical system we call the biosphere. There is no inherent conflict between protecting the environment and a robust human economy since the environment supports all human activity.

b.3 Engineers towards a just and sustainable future

How do we create a life that allows all present and future humans to be healthy, have their basic needs met, have fair and equitable access to the Earth's resources, have a decent quality of life and preserve the biologically diverse ecosystems on which we all depend? Future scientists, engineers, and business people must design technology and economic activities that sustain rather than degrade the natural environment, enhance human health and well-being, and mirror and live within the limits of natural systems. We must dramatically reduce our economy's resource and energy throughput and minimise our ecological footprint to maintain the life support system that will make a sustainable future possible. It calls for a New Industrial Revolution that builds upon the information and biotechnology revolutions of the past half-century. It is to note here that the world population

will be stabilised at a level that should be within the short and long term carrying capacity of the Earth's finite resources. This level is of great debate and is probably between ten and twelve billion people, which we will reach within the next fifty years.

Now let us come to a serious point about our discipline- the science of economics. Economics is caught in the trap of *model-blind science*.⁴ Some of us even try to propose '*the*' model and not the '*a*' model. This *blindness* originates from not recognising that: *Correlation failing to establish causality is the death of causation*. It is not to say that models are useless. However, models are never true; but there is truth in models. Also, it is not unfounded that most economists (most model builders) have adopted a fragmentalist and reductionist approach to a social phenomenon, making unfounded universal claims, ignoring the social, cultural, and political context, reifying markets and material incentives, and having a conservative bias. More so, many assumptions that go into economic models – perfect competition, perfect information, and perfect foresight – are patently untrue. Also, economists' obsession with choices made by individual households or individual investors – hides the fact that preferences and behavioural patterns are "socially constructed" or imposed by the structure of society.⁵ Here it should be noted that Economics provides many of the stepping-stones and analytic tools to address the significant public issues of our time. What economic science does not provide is definitive, universal answers. The results obtained from economics proper must be combined with values, judgments, and evaluations of a moral, ethical, political, or practical nature. These last have very little to do with economics but everything to do with reality. Here comes the potential role and responsibility of Engineering Science (and all other natural sciences) because they ought to deal with reality holistically.

Based on the above-stated arguments and realities, it is time to raise issues of our common interest: What should be our vision towards sustainable future development? Let me forward *Eleven Commandments* that need to be internalised by the Engineering Sciences to accelerate sustainable future development. The Eleven Commandments are as follows:

⁴ To learn more about "Model-blind Science" which based on data-centric vocabulary fails to understand causal links and suffer from pretensions see, Pearl, J. & D. Mackenzie. (2019). *The Book of Why. The New Science of Cause and Effect*. UK: Penguin Books.

⁵ To understand more about what went wrong with economic models and assumptions behind, what's wrong with scientific pretensions of economists, why a model (or theory) is at best contextually valid and alike, please see, Rodrik, D. (2016). *Economic Rules. The Rights and Wrongs of the Dismal Science*. NY: W.W. Norton & Company.

1. ***We will use resources efficiently.*** Leading scientists have been calling for a considerable increase in resource productivity -- by a factor of 4-10 to increase wealth for 4/5 of the world's population and decrease environmental impact. It is critical because the industrialised economy is incredibly wasteful in using resources while the planet has a finite amount of resources and a finite ability to absorb and process wastes. In their thought-provoking book *Factor Four: Doubling Wealth, Halving Resource Use*, Ernst von Weizsacker and Amory and Hunter Lovins call for a revolution in energy and resource productivity and provide over 50 demonstrated examples of factor 4 increases in energy, material and transportation productivity from a variety of institutions around the world. With a few exceptions, they all cost less than conventional means of doing business and increased social and economic and environmental sustainability.
2. ***We will learn from and live within natural systems.*** Humans are the only species on Earth that produce waste that is not raw material or nutrient for another species. Also, we are the only species to produce wastes that can be broadly toxic and buildup for long periods. A sustainable society should eliminate the concept of waste. Waste is not simply an unwanted and sometimes harmful by-product of life; it is a raw material out of place. Waste and pollution demonstrate gross inefficiency in the economic system since they represent resources no longer available for use and/or harm humans and other species.
A sustainable economy would mirror nature's "circular" method of using matter and employ the concepts of design through which all waste would be the "food" (waste = food) for another activity. This idea is integral to industrial ecology. Metal extraction and conversion would be replaced by strategies to cycle existing metals through the economy continuously. For example, recycling aluminium rather than virgin bauxite ore reduces energy use by 95% and pollution by 99%.
3. ***We will use renewable resources at a rate less than or equal to the natural environment's ability to regenerate the resource.*** It means living off the income, not the capital -- e.g., practising sustainable forestry, sustainable fishing and sustainable agriculture. To cite an example, every ton of paper made of recycled fibre saves seventeen trees and cuts air and water pollution by 30-50%. Organic farming and agricultural production that minimise pesticides and fertilisers while conserving soil and water are safer and more sustainable.

4. ***We will rely less on non-renewable energy.*** Over 85% of the world's energy comes from fossil fuels. This form of energy use causes significant environmental and health problems such as black lung disease, air pollution, acid rain, oil spills and global climate change, to name a few. The desire for a continuing "cheap" supply of fossil fuels has had enormous military and economic costs to keep the oil and gas flowing worldwide, especially from the Middle East. Moreover, this fossil fuel dependence has been economically unsustainable for more than a few decades -- it took 10,000 days for nature to create the fossil fuels that society consumes in one day!
5. ***We will increase the production of durable, repairable goods and eliminate persistent, toxic and bio-accumulative substances.*** At the same time, we will eliminate disposable goods as much as possible and detoxify the production process by minimising the use and discharge of toxic substances. Products would be designed for disassembly so that the materials could be utilised in making new products. For example, several manufacturers (Volkswagen, Volvo, BMW) are redesigning automobiles to recycle at least 90% of the materials into new automobiles.
6. ***We will focus on providing the ultimate ends of products or services, not the products or services themselves.*** A key to resource efficiency is to understand products to deliver a service to a customer. For example, people do not want energy, and they want the service it provides, such as heat or light. Similarly, people want access to people, places, things and experiences, not necessarily increased transportation. An example of a company that has adopted this idea is Interface, the largest commercial carpet tile company globally, which now leases carpet. The lessee gets the service of the product -- warmth, softness, acoustic value, and aesthetics for a fee. When the carpet is worn out, Interface takes it back and recycles it into a new carpet.
7. ***We will create low energy consuming transportation systems.*** We must accelerate the development of alternative fuel vehicles that minimise and eventually eliminate dependence on fossil fuels and accelerate mass transportation.
8. ***We will create an environment where all people will understand their connection to the natural world and other humans.*** They will understand their "ecological footprint", i.e., they will know where products and services come from, where wastes go, and what they do to humans and other living species. They will appreciate that driving a car in Ohio may

cause flooding in Bangladesh through global warming or that cutting down forests in Brazil may deprive someone in Hungary of a lifesaving drug. For all people – led by professionals such as engineers – minimising their ecological footprint and "walking lightly" on the planet will be "second nature."

9. *In today's world of (over) consumerism, an average person in a developed country receives 2,000 advertising messages per day oriented toward consumption.* The public is often portrayed as a group of consumers, not citizens. However, increased consumption and material acquisition alone has not led to a happier, safer and more secure population. We will ensure that all current and future generations of humans can meet their basic needs, pursue meaningful work and have the opportunity to realise their full human potential personally and socially.
10. *We will have timely economic, social and environmental signals that encourage environmentally and socially sustainable behaviour.* The economic measures of success we use today, such as the GNP and consumer price index, discourage conservation and encourage waste, consumption, and the substitution of capital for jobs. The price of goods and services reflects all the profits to the producers but does not include all the social, environmental and health costs to the society. In a sustainable society, we would have more development, i.e., qualitative improvement in people and value-added to resource use, than quantitative growth in resource and energy-intensive economies. We need to think hard about full-cost (including social and environmental) accounting for economic activities, development of macroeconomic indicators that truly reflect societal well-being (e.g., Index for Sustainable Economic Welfare, Genuine Progress Indicator) and taxation, which taxes the undesirables (energy and resource consumption) and not the desirable (education, health, employment).
11. *We will put all-out efforts so that nations act as a Global Family.* The relationship between the developed and the developing countries must be changed. Industrial countries must reduce their consumption of the world's resources in the face of the desperate need of developing countries to improve well-being, health, reduce all forms of poverty and inequality, and social instability. Today, a child born in the US will consume as much of the Earth's resources and produce as much waste as more than 100 Bangladeshi children. We also need new approaches for transferring technology, training and education, good health and well-being, and

providing financial assistance to developing countries. These approaches must address population deprivation, improving women's educational and social status, the international debt problem, cooperation in all possible fields of humane development, and the need for sustainable economic strategies.

B.4 What should be the Role of Engineers and Engineering Education?

Let me be straight: Engineers – socially responsive and visionary ones – must lead this new industrial revolution and carry forward the above vision for human development and cooperation. The professional bodies of engineers are well-placed to make sustainable development a high priority in engineering and business -- both in practice and in the education of future engineers. They are in a place to promote codes of practice, education, mentoring programs and policy changes that will encourage the engineering profession to lead this revolution.

Let me forward one more issue to ponder over/on. A current fundamental problem is an underlying assumption (by many) that environmental protection should be left to environmental professionals. However, environmental specialists alone will not help us move toward a sustainable path. All humans consume resources, occupy ecosystems and produce waste. We need all professionals to carry out their lives and activities in an environmentally sound and sustainable manner. However, the truth is that the current education and training of most environmental professionals who are and will be employed by government, industry, academia and environmental organisations is narrowly focused and incomplete. Most of these professionals are trained in dealing with a subset of environmental problems such as air pollution, water pollution, or hazardous waste but are not trained to deal with environmental issues in an integrated and holistic fashion. Training focuses on controlling pollution and waste once created and removing environmental damage, rather than reducing or eliminating pollution and waste generation at the source.

I believe that designing a sustainable future requires a paradigm shift towards a systemic perspective that encompasses the complex interdependence of individual, social, cultural, economic and political activities and the biosphere. The future engineers must be much more interdisciplinary -- the lines between the traditional engineering disciplines must be much more fluid or removed altogether. Engineers will have to join forces with biologists, chemists, meteorologists, economists, planners, political scientists, ethicists and community leaders to lead society on a sustainable path. Since we will likely double the amount of housing and building construction in the twenty-first century (and

buildings utilise a tremendous amount of materials and energy), engineers must team up with other professionals to revolutionise construction. It is just one of many examples of much intended second nature-based new industrial revolution.

I believe that there is a unique role for engineers in the future. Rather than being the engineers that primarily design technologies to control or remediate pollution, I believe the engineers will be the interdisciplinary systems specialists. They will bring together, coordinate and manage all the specialists to solve complex problems promoting sustainable development.

Engineers must be better informed of the interdependence of environmental, economic, health and social issues, inform others and become leaders. In addition, all engineers must play a much more decisive role in the public policy process to provide the right incentives for industry and others to move on a sustainable path so that engineers can be encouraged and supported to design sustainable technology. If this does not happen, then the agenda will be set by others who neither know the benefits nor the limits of technology in a changing society.

Such a shift in the thinking, values, and actions of all individuals and institutions worldwide calls for a long term societal effort to make environmental and sustainability concerns a central theme in all education, particularly for engineers, economists and business people. If we are to achieve a sustainable future, higher education institutions must provide the awareness, knowledge, skills, and values that equip individuals to pursue life goals in a manner that sustains human and non-human well-being. It is critical since higher education prepares most professionals who develop, manage, teach-in and influence society's institutions. It is, however, essential to note that to the best of my knowledge to date, no engineering school has made design for the environment, industrial ecology, pollution prevention or the relationship of technological development to sustainability the cornerstone of engineering education. Here, I see a necessity for change in the mindset. Here, learning content must embrace an interdisciplinary, systemic approach to address environmentally sustainable development on local, regional and global scales over short-, medium- and inter-generational periods.

C. Some Concluding Remarks

I believe we have two choices as a society: First, continue business as usual -- promote population and rapid economic growth that maximises materials and energy and then head for the new horn of plenty, with no time for recycling, efficiency or restoration as the cure for all our social, health, political (and some say) environmental problems. Let nature set the limits through environmental collapse, poverty, inequality, malnutrition, social instability, and war. Let me put

it bluntly: One definition of insanity is doing the same thing over and over again and expecting a different result!

A second choice is for humans, as the most self-aware species that can learn very quickly, to take deliberate individual and collective steps to find civilised and cooperative ways to live in harmony with each other and the rest of nature. It means respecting and living within nature's limits, using energy and resources as efficiently as possible, maintaining the integrity of the life support system and helping all people meet their needs. This second choice is the best. Furthermore, "socially responsive" engineers are better placed to take up this challenge to make the best of the opportunity to design the knowledge base and technology that will lead us to a sustainable common future.

Microfinance Loan and Causes of Dropping Out of Women Borrower: An Empirical Study on Chattogram Urban Area

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Abstract

Dropping out from any NGO does not always indicate the defaulter borrowers. Sometimes for economic solvency, the borrowers may not take a further loan. The other group expelling from any NGO should indeed be the big concern of society. Undoubtedly, they are losing their assets and becoming poor and poor again. This study investigates why women borrowers drop out from the loan of different Microfinance NGOs. It will also focus on the expelled dropout and find out the influencing factors behind this status. This research is based on survey data considering the dropout women borrower in two groups as willingly dropped and expelled dropped out. After consulting with different NGOs, the dropped out borrower has identified and sorted with different tables and found the natural causes. Here, different statistical tools like charts, ANOVA table with chi-square test have been used for this analysis.

JEL Classification G21· G23· G53

Keywords Microfinance · Willingly Dropped Out Borrower · Expelled Borrower · NGOs in Chattogram

1. Introduction

Women workers throughout the world contribute to the economic growth and sustainable livelihoods of their families and communities. Microfinance helps

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empower women from poor households to make this contribution. Microfinance—the provision of financial services to the poor in a sustainable manner—utilizes credit, savings, and other products such as micro-insurance to help families take advantage of income-generating activities and better cope with risk. Women particularly benefit from microfinance as many microfinance institutions (MFIs) target female clients. Over 3,300 microfinance institutions reached 133 million clients with a microloan in 2006. Need to be mentioned that 93 million of the clients were among the poorest when they took their first loan, and 85 percent of these poorest clients were women. (Microcredit Summit Campaign Report 2007). Microfinance usually targets people who are below the national income average line. The term micro is used here because the amount of financial assistance generated to the poor is in a small amount loan. It helps different from formal banking, which disburses the loan in large quantities, mainly to rich people. Because of the global recession, governments in many developing countries are encouraging micro-financing as it is believed that it is the most effective method to reduce poverty while empowering individuals. More than three lac people are taking this facility and 697 NGOs in Bangladesh whom micro financing institutions are serving. In Chattogram, there are more than 1 lac people, and 229 registered NGOs are being served. (MRA-MIS Database-2014) As the women are the main clients of this program, this article discusses their dropping out and the causes behind this status. By this, we can go for the remedial measures and promote the capacity building of women.

2. Objectives

As we know, dropped out borrowers are divided into two groups as willingly and expelled; therefore, this study will sort them and analyse the following aspects based on Chattogram City:

- a) The comparative scenario of using of the loan in different purpose by women borrower
- b) Occupational Status of the dropping out women members
- c) Causes of this dropping out.

3. Definition of Keywords

- a) **Microfinance:** Microfinance, also called microcredit, is a banking service provided to unemployed or low-income individuals or groups who otherwise have no other financial services. Ultimately the goal of microfinance is to give impoverished people an opportunity to become self-sufficient.

- b) **Willingly dropout:** If any member reimburses their loan and does not want to borrow a loan again or thinks she does not need a loan that call willingly dropped out member.
- c) **Expelled dropout:** If any member could not continue his instalment loan given by a timeframe by a particular NGO. As a result, that NGO authority may declare him as a defaulter. Thereby they are called an expelled borrower.
- d) **Chattogram** is a major coastal seaport city and financial centre in south-eastern Bangladesh. The city has a population of more than 2.5 million, while the metropolitan area has a population of 4,009,423 at the 2011 Census, making it the second-largest city in the country. It is the capital of an eponymous district and division. The city is located on the banks of the Karnaphuli River between the Chittagong Hill Tracts and the Bay of Bengal. Much of the Chittagong Division is located within the ecological Indo-Burma zone on the India Plate and Burma Plate boundary. It makes Chittagong the crossroads of the Indian subcontinent and Southeast Asia. Various names have known the port city in history, including Chatigaon, Chatigam, Chattagrama, Islamabad, Chattala, Chaityabhumi, Porto Grande De Bengala, Baro Auliya Jaiga (Wikipedia).

4. Methodology

The concerning point of this study is to find out the causes of the dropping and making the relationship between who and why. We have consulted with a few NGOs to know who left this type of institute recently. That is how a total of 85 credit receivers who had already left the microfinance programme have been interviewed using a well-designed questionnaire. Samples were taken from four areas in Chattogram city. During data collection we found some NGOs took the facilities of loan. We also took them as a reference to get other defaulters. The Microcredit institutes are BRAC, ASA, TMSS, UDDIPON, YPSA, ISD.

An organized questionnaire was used for the sample borrowers belonging to all the above institutes. The data has been collected randomly considering dropout members of different NGOs. This interview was taken from January 2018 to March 2018, and the distribution is shown in Table 1 below.

Name of the Area	No of Respondents
Kolonelhut	24
Aman Bazar	28
Firingibazar	23
Panchlaish	10
Total	85

Source: Field Survey

4.1 Limitations

The study is based on non-probability sampling, where identifying and reaching the dropout borrower was a big challenge. Most of the respondents were less educated. Likewise, they did not want to share their authentic information.

5. Data Analysis

This section will analyze every dropped woman individual borrower of the microfinance program and the dropout cause. Besides this, we will find out the comparative scenario of using of loan. In this pursuit, field survey data has been used.

5.1 Nature of the dropped out borrower

The nature of the dropped out borrower has shown in Table 2.

Table 2: Nature of the dropped out borrower

Nature	No.of Dropout	Percentage
Willingly	11	12.9
Expelled	74	87.1
Total	85	100

Source: Field Survey

Table 2 shows that 12.9% is willingly dropped, and 87.1% is expelled from the Micro Finance Loan. As the willingly dropped out persons leave the MF because of their economic solvency, our primary focus will be on the rest of the portion, where the respondents failed to continue the loan.

5.2 Respondents age pattern

The age structure of the respondents is shown in Table 3.

Table 3: Age level of the borrower

Age	Dropped out		Total	%
	Willingly	Expelled		
Below 20-30	5	31	36	42.35
31-40	4	21	28	32.95
41-50	2	12	14	16.47
51 Above	--	7	7	8.23
Total	11	74	85	100

Source: Field Survey

Table 3 reveals that the expelled young age group of women borrower is the highest no of dropping out. Because of a lack of experience and management, they could not continue the loan for the long term.

H1 = No. of Dropout depends on the age of the borrower.

As the Computed value of χ^2 is less than the tabulated value, we will accept the null hypothesis. Hence, we can say different ages of the borrower's influence on the number of dropping out borrowers.

5.3 Occupational status of the Respondents

The occupational status of the respondents is shown in Table 4.

Table 4: Occupation of the borrower

Occupation	Dropped out		Total	%
	Willingly	Expelled		
Business	2	15	17	20
Housewife	6	38	44	51.77
Job	3	17	20	23.53
Maid	0	3	3	3.53
Other	0	1	1	1.17
Total	11	74	85	100

Source: Field Survey

Table 4 proves that the housewife group percentage dominates other occupations. It was found that when the women are involved in any earning source, the husband becomes dependent on her and tries to ignore his own earning. Besides this, the expelled dropped group is 51% of the total number. It speaks that this group did not use their loan with their own decision.

O	E	(O-E) ²	(O-E) ² /N
5	4.65	0.122	0.026
4	3.62	0.144	0.039
2	1.81	0.0361	0.019
0	0.90	0.81	0.9
31	31.3	0.09	.0028
21	24.4	11.54	.47
12	12.18	0.0324	.0026
7	6.09	0.8281	5.04
			$\Sigma(O-E)^2/N=6.4994$

H_2 = No of dropout borrowers depends on their occupation

	O	E	(O-E) ²	(O-E) ² /E
	2	2.2	0.04	0.01
	6	5.69	0.09	0.015
	3	2.6	0.16	0.06
	0	0.39	0.15	2.6
	0	0.13	0.016	0.12
	15	14.8	0.04	0.002
	38	38.3	0.09	0.002
	17	17.41	0.16	0.009
	3	2.61	0.15	0.057
	1	0.87	0.016	0.018
$\Sigma(O-E)^2/N = 2.9$				

$\chi^2_{4, 0.05} = 9.49$

As the Computed value of χ^2 is less than the tabulated value; as a result, we accept the Null Hypothesis and which reflects that the number of dropping out borrowers depends on their occupation. We can also say that the borrowers do not have their own income source; they depend on others. This borrower group did not use microfinance loans properly. As a result, they were dropped.

5.4 Household members of respondent's family

Household members of the respondent's family are shown in Table 5.

Table 5: Household members of the respondent's family

Family Member	Dropped Borrower		Total	%
	Willingly	Expelled		
Below- 4	4	56	60	70.59
5-7	6	11	17	20
8 -10	1	7	8	9.41
Total	11	74	85	100

Source: Field Survey

Table 5 shows that the less number of household family members group is more defaulter. Here 75% of expelled borrowers are coming from a lower number of the family members group.

$H_3 =$ No of dropout borrower depends on their household number.

0	E	(O-E) ²	(O-E) ² /N
4	7.76	14.13	0.166
6	2.2	14.44	0.17
1	1.03	0.0009	1.05
56	52.23	14.21	0.17
11	14.8	14.44	0.16
7	6.96	0.2010	1.88
$\Sigma(O-E)^2/N = 3.596$			

$$\chi^2_{2, 0.05} = 5.99$$

Due to the calculated value of χ^2 being less than the tabulated value. Consequently, the null hypothesis is accepted. Hence, we conclude that the dropout borrower depends on their household members.

5.5 Number of earning members of Respondents family

Table 6: The number of earning members of respondents

Earning Members	Dropped out		Total	%
	Willingly	Expelled		
1	5	39	44	51.77
2	4	25	29	34.12
3	1	9	10	11.76
Above -3	1	1	2	2.35
Total	11	74	85	100

Source: Field Survey

Table 6 reveals that the household that has more working hands are less expelled. That means others sources of income influence the respondents to make them stable in the MF loan.

$H_4 =$ No of dropout borrower depends on the earning members.

0	E	(O-E) ²	(O-E) ² /E
5	5.69	0.47	0.08
4	3.75	0.06	0.016
1	1.29	0.08	0.06
1	0.26	0.54	2.07
39	38.30	0.49	0.01
25	25.24	0.05	0.001
9	8.70	0.09	0.010
1	1.74	0.54	0.31
$\Sigma(O-E)^2/N = 2.557$			

$$\chi^2_{3, 0.05} = 7.81$$

They are the computed value of χ^2 and the tabulated. So, we accept the null hypothesis. It means that the number of dropout borrowers depends on the earning member. In other words, which family has more earning members, they would drop less from the microfinance loan, and also they can achieve their targeted goal of development or change their social status.

5.6 Economic status of respondents

Table 7: The economic status of respondents

Monthly Income '000	At the Time of Joining in MF Programme		At the Time of Leaving in MF Programme	
	Willingly	Expelled	Willingly	Expelled
5 -10	--	21	--	20
11- 20	7	28	1	35
21-30	3	17	6	15
31- 40	2	8	2	2
41-Above	--	--	2	2
Total	11	74	11	74

Source: Field Survey

Table 5.6 reveals that the lower income group has no changed in at the time of joining the MF program and at the time of leaving this program. Besides this, few expelled groups' incomes have been reduced during the departing of NGOs. In this Table, we find that higher-income groups are dropped willingly less because inflation has influenced their income level.

Table 8: The saving amount scheme of the respondent

Savings Amount	Dropped out		Total	%
	Willingly	Expelled		
Below10K	2	26	28	
11-20K	2	24	26	
21-30K	2	9	11	
31-40K	3	8	11	
41-50K	1	6	7	
51K-Above	1	1	2	
Total	11	74	85	

Source: Field Survey

5.7 Saving amount scheme of Respondents in the Microfinance programme

The saving amount scheme of the respondent is shown in Table 8.

Source: Field Survey

Table 8 shows that the highest saving amount scheme growth is the lowest expelled borrower group. This savings scheme is played the insurance for the loan here.

H_5 = No of dropout borrower depends on savings amount in microfinance programme.

O	E	(O-E) ²	(O-E) ² /N
2	1.74	0.0676	0.0008
2	0.29	2.924	0.0344
2	1.16	0.7086	0.0083
3	1.03	3.88	0.04
1	0.77	0.0529	0.0006
1	0.13	0.7569	0.38
26	22.63	11.35	0.13
24	20.89	9.67	1.48
9	7.83	1.36	0.49
8	6.96	1.08	0.40
6	5.22	0.60	0.25
1	1.74	0.64	0.01
$\Sigma(O-E)^2/N=3.22$			

$$\chi^2_{5,0.05} = 11.1$$

The tabulated value is 11.1, and the computed value of χ^2 is 3.22. Therefore, we accept the null hypothesis. The savings amount of borrowers are another factor of leaving the MF program. Which borrowers have massive amounts of savings, they live a long time in MF and have a small amount of savings they did not survive a long time in the MF programme, and those borrowers have been dropping out.

5.8 Maturity of Loan

Table 9: The maturity of the loan

Year	Dropped out		Total	%
	Willingly	Expelled		
New	--	11	11	
One Year	1	8	9	
2---5	4	23	27	
6 ---7	2	14	16	
8 ---9	2	8	10	
10 -- Above	2	10	12	
Total	11	74	85	

Source: Field Survey

Table 9 reveals that borrowers who took new loans are less experienced. That is why 100% of borrowers were expelled. We find that 11 persons do not have previous income, so they could not continue the loan. Those expelled dropped show that after many years of the loan, they had a previous income source.

H_6 - No of dropout borrower who has been leaving MF programme before the mature of their loan.

0	E	(O-E) ²	(O-E) ² /N
0	1.42	2.01	0.02
1	1.16	0.0256	0.0003
4	3.49	0.2601	0.00306
2	2.07	0.0049	0.00005
2	1.29	0.50	0.0058
2	1.55	0.20	0.0023
11	9.57	2.04	0.024
8	7.83	0.0289	0.00034
23	23.5	0.25	0.0029
14	13.9	0.01	0.0001
8	8.7	0.49	0.0057
10	10.44	0.1936	0.0022
		$\Sigma(O-E)^2/N=0.066$	

$$\chi^2_{5,0.05} = 11.1$$

Being the computed value of χ^2 is less than the tabulated value. So, we accept the Null Hypothesis. We can say that no dropout borrower has been leaving the MF programme before the mature of their loan.

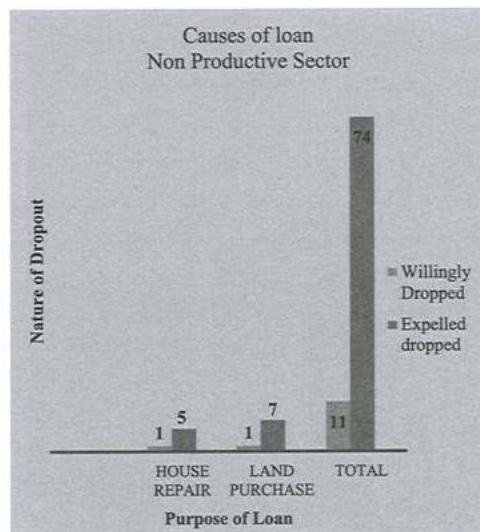
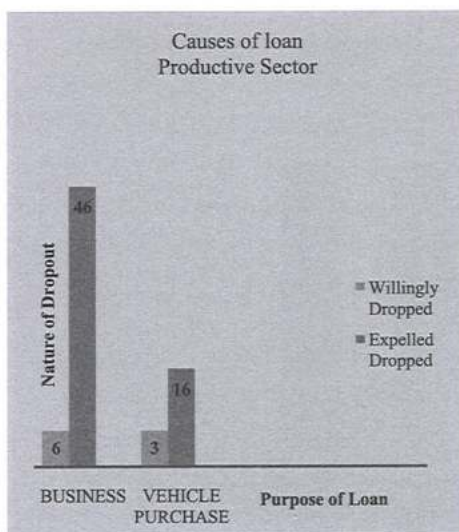
5.9 Causes of loan

In this Table, we can say that willing borrowers got more success in the productive sector. Table 10 proves that most of them dropped the loan for business, and within this, 62% of borrowers were expelled for many reasons.

Table 10: The causes of taking loans

Purpose of Loan	Productive Sector	Expelled dropped
	Willingly Dropped	
Business	6	46
Vehicle Purchase	3	16
Non Productive Sector		
House Repair	1	5
Land Purchase	1	7
Total	11	74

Source: Field Survey



Decide this the expelled borrower got less success in the productive sector because they use their loan for other purposes.

5.10 Comparative scenario of using of Loan

5.10.1 Willing dropped Respondents

5.10.2 Expelled dropped out Respondents

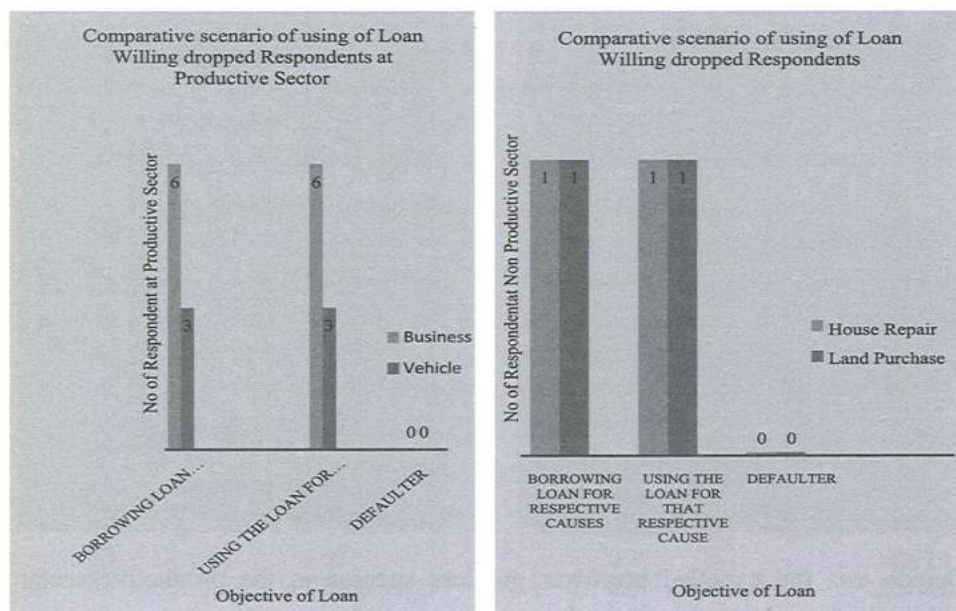
Figures in the above Table reveal that there is no defaulter in case of willingly dropped.

Here 74% of the expelled borrower did not use their loan judiciously. A 74% use their loan for different purposes. On the other hand, 50% of borrowers did not use their loans for respective reasons.

5.10.3 Distribution of 58 defaulters

Objective of Loan	Productive Sector		Non Productive Sector		Total
	Business	Vehicle	House Repair	Land Purchase	
Borrowing loan for respective causes	6	3	1	1	11
Using the loan for that respective cause	6	3	1	1	11
Defaulter	0	0	0	0	0

Source: Field Survey



Objective	Productive		Non Productive		Total
	Business	Vehicle	House Repair	Land Purchase	
Borrowing loan for respective causes	46	16	5	7	74
Using the loan for that respective cause	06	1	2	7	16
Defaulter	40	15	3	58	58

Source: Field Survey

5.11 No of instalments failed to pay

The number of instalments failed to pay is shown in the following Table:

As shown above, most of the expelled borrowers become defaulters in the very early stage.

5.12 Distribution of reasons for expelling

The distribution of reasons for expelling from the MF programme is shown in

Using of Loan	No of Borrower	Remarks
Meet the daily need	13	
Extra Marriage, Dowry, Gambler, Loan to other	45	
Total	58	

Source: Field Survey

The number of instalments failed to pay is shown in the following Table:

No. of Instalments	Borrowers Failed to Pay	%
1-3	33	44.59
4-6	31	41.89
7 or Above	10	13.52
Total	74	100

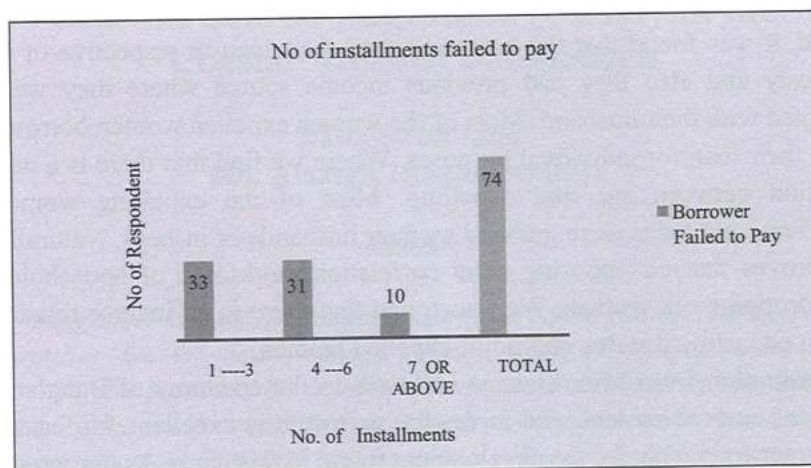


Table below:

The above Table gives the comparative scenario of caucuses expelled from the program. Most of the expelled women bower lost their tempo because their

Cause of Failed to Pay	No. of Forced Drop out.	%
Husband was fugitive with loan & got Extra Marriage	18	24
Dowry	17	23
Gambling	10	13
Over Loaded Loan	10	14
Meet the Daily need	13	18
Wrong Dealing	6	8
Total	74	100

Source: Field Survey

husbands became nefarious and got extramarital affairs. That is how the income was divided into two families, and the probability of becoming a defaulter increased. It also proves that in most cases, husbands and laws families push them to give dowry. Here sometimes, women give the money to their husbands for

business, but their husbands use this loan for gambling. In this Table, we find that few loans are overloaded, and they cannot afford them. Again many defaulters use their loans for their daily needs.

6. Summary and Conclusions

The findings of this study have several main implications for the academic, microfinance institutions, and policymakers. Here we find that most of them dropped out are forced from different types of NGOs. In case of willingly dropped, it was found that the borrower used their loan in respective of causes judiciously and also they had previous income source where they were not interrupted with their husband. Most of the women expelled women borrower did not use their loan for individual purposes. Where we find that there is a negative correlation between age and expelling. Most of the expelling women are housewives, and loans were grabbed by their husbands or in-laws. Naturally, this study proves that an opposing solid correlation workforce of households and forced dropping out women. We also found that there is an inverse relationship between educational status and no of expelled women.

Contribution from Microfinance institutes to the economy of Bangladesh is significant even at present, and in the future, too, it is excellent. Unfortunately, various constraints hinder the development found in this study. As our women are the main clients of Microfinance, therefore Government has many things to do to reduce the shortcomings. Besides this, the NGO bureau as a guardian should play a vital role here because the main focus of microfinance is to reduce poverty and uphold women's rights. If the women are expelled from the scheme, they will be economically looser and again neglected by society.

7. Recommendations

This study has produced several credential findings that need to be dealt with by borrowers to improve their status. Also, few recommendations for the stockholder which has given below:

- (a) NGO bureau should maintain a central database of borrowers where necessary information can be accessed officially.
- (b) Every MF institute must have a web-based list of dropped borrowers defined with their status.
- (c) MF institute should consider the age and educational status more in giving the enormous loan size.
- (d) MF institute should have specific intelligence to monitor the use of loans by the borrowers.

Reasons behind Migration: A Study in the Coastal Areas of Bangladesh

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Abstract

Bangladesh is a deltaic coastal country and one of the most vulnerable countries due to climate change globally. From the coastal areas, a considerable portion of the population is displaced almost every year, both temporarily and permanently, due to natural calamities and other socio-economic reasons. The purpose of the study is to find out the impact of climate change on migration in the coastal areas of Bangladesh. Primary data is used to investigate the study objectives. Data were collected from the coastal regions of Bangladesh. A multi-stage cluster random sampling technique is used to select the sample unit. The total sample size is 450. The data are collected by interview method with a structured questionnaire. To analyse data, descriptive statistical analysis and econometric analysis have been used to investigate the study's objectives. The econometric analysis suggests that climatic vulnerabilities and economic insolvency have a significant impact on migration. Other variables (social problem, education, lack of health care facilities, and lack of job opportunities) have influenced migration, but the result has not been statistically significant. A unit increase in climatic vulnerabilities increases the odds in favour of migration decision by 3.753 points. So, it is clear that sudden onset and slow onset climatic events influenced migration in the coastal regions of Bangladesh. One unit increase in economic insolvency leads to an increase in the odds of migration by 2.465

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points. Climate change makes coastal peoples and their livelihood, earnings sources, and job facilities vulnerable, and they migrate from their place of residence to another location. So, the stakeholders and policymakers should undertake a climate resilience development policy to create alternative livelihood activities or employment opportunities, along with skills development in the coastal regions of Bangladesh.

JEL Classification R23 · N35 · J61 · J11

Keywords Migration · Coastal Area · Bangladesh

Introduction

Bangladesh, one of the most densely-populated countries globally, is situated in the world's most significant delta, formed by the rivers Ganga, Brahmaputra, and Meghna. Coastal environments, particularly at risk, include mangroves, tidal deltas and low-lying coastal plains, sandy beaches, coastal wetlands, estuaries, and coral reefs. These bio-geophysical possessions will have consequent effects on ecosystems and eventually affect socio-economic systems in the coastal zone. As a result, a large number of people migrate from their villages to nearby areas. Lein (2000) stated that Bangladeshi coastal communities had faced environmental challenges for the last few centuries. Ministry of Environment and Forest of Bangladesh Government (2005) mentioned that Bangladesh and its population are highly vulnerable to the adverse effects of climate change. The scale and frequency of extreme climate events have been steadily increasing, making survival difficult and expensive. Myers (2002) described that people could not cope with these events; more than 26 million people in Bangladesh are likely to migrate, i.e., almost 16% of the country's total population. Migration occurs in response to multiple pressures, and it is difficult to isolate environmental pressures from ongoing economic ones. Thus, the effects of climate change increase the impetus towards migration, forcing people to search for safer environments that can offer them reliable livelihoods and household security (Black, 2008).

Migration is not a new phenomenon in Bangladesh. The process of rural to urban migration in Bangladesh started a long time ago. It existed in the historic and Mughal periods. During the British period, migration was low in this subcontinent because of economic, social, and cultural reasons. After the partition of India in 1947, migration in Bangladesh (then East Pakistan) was mainly international, being pursued by the influx of refugees from India. Rural-urban migration, however, even before the liberation of Bangladesh in 1971, did not receive momentum. After liberation, several socio-economic and political factors have contributed to increasing the internal migration rate in Bangladesh.

However, a mix of pull and push factors have been identified to account for the internal migration in Bangladesh (Chaudhury, 1976).

Islam (2004) stated that the coastal zone covers 47,201 square kilometre land area, which is 32 percent of the country's total landmass. UNCLOS (1982) mentioned that the water area covers 370.4 km (200 nautical miles) from the coastline estuaries and the internal river water. According to the coastal zone policy (CZPo, 2005) of the Government of Bangladesh, 19 districts comprising 163 Upazilas and the Exclusive Economic Zone (EEZ). A total of 48 Upazilas are exposed to the sea, and lower estuaries among 12 districts, are defined as the exposed coast, and the remaining 115 Upazilas of the coastal districts are termed as interior coast.

In Bangladesh, the typical climate change elements that affect lives and livelihoods in the coastal locations are temperature increases and variations in rainfall. It was found that the coastal study districts, e.g., Khulna and Patuakhali were very vulnerable to both rapid onset events and processes, such as cyclones, storm surges, tidal floods, and slow onset events, like salinity intrusion and sea-level rise. Most of the people in the coastal areas migrate due to climate change. People living in the rural areas, especially in the coastal areas of Bangladesh, are often affected by hazards directly linked to climate change, such as cyclones and storm surges. Frequent storms, floods, and droughts were everyday things that made the situation worse in Bangladesh. Due to these forces, 12-17 million Bangladeshis moved to India, and half a million moved internally (Homer-Dixon, 1999; Lee, 2001; Swain, 1996).

Many works have been done on this issue in the context of different regions of Bangladesh. It is found that climate change adversely affects migration, especially in the coastal zones. A small number of works have been done in the coastal areas. Was so identifying the main reasons behind migration in the coastal areas is highly needed in Bangladesh.

The objective of the study

The general objective of the research is to find out the main reasons behind migration in the coastal areas of Bangladesh. However, the specific objectives of the study are to find out:

- i) The economic reason responsible for migration and
- ii) Climatic factors and their effects on migration.

Literature Review

A significant body of literature indicates that prehistoric human settlement and migration patterns had strong linkages to changes in climatic conditions and other

socio-economic conditions. Climate change is a significant component of global environmental change which influences drivers of migration across overlapping environmental, demographic, political, social, and economic spheres (Black et al., 2011; Foresight, 2011). Projections suggest that a large part of such migration will be in the Global South, within countries or nearby countries, including areas of environmental risk (Foresight, 2011).

Afolayan and Adelekan (1999) exposed that male household members have often migrated to Khartoum in search of wage labour when low rainfall hinders agricultural production in Western Sudan. Meze-Hausken (2000) presented that families undertake migration during times of drought after other measures, such as reducing food consumption and selling off possessions, have been exhausted in dryland areas of Ethiopia.

Stern Review (2007) also mentioned that both sea-level rise and other climate-induced changes could submerge one-fifth of the current territory of Bangladesh. Sea level rise has already caused land erosion, increased salinity in coastal areas. More than one million people have already lost their homes, and 70 percent of these people became landless due to river erosion. Initially, these people stayed in nearby areas. RMMRU (2007) mentioned that at present, affected people have adequate knowledge that the slow siltation process and high population pressure will make their condition worse and ultimately force them to move to somewhere safe, especially in urban areas.

Bangladesh has been rated as the third most vulnerable country globally in terms of people affected by sea-level rise. By 2050, supposing a sea-level rise of 27 cm, around 33 million people would be suffering from surging. A 1 m rise in sea level would submerge a complete 18 % of the total land area in Bangladesh (Pender, 2008). Islam (2004) mentioned that global warming will cause an annual temperature rise of 0.4 degrees Celsius in Bangladesh and result in greater frequency and intensity of cyclone storms. At least 70 significant cyclones have hit the coastal belt of Bangladesh for the past two hundred years. The extent of sea-level rise and cyclones will strongly affect the coastal system and its living style. Non-climate stresses may already have unfavourably affected the coastal living style, and thus it is unable to cope with additional pressures. As a result, people moved from coastal areas to the nearest villages.

Syed and Amin (2016) indicate that the average maximum temperature of the country has increased in pre-monsoon by 0.016°C per year, in monsoon by 0.034°C per year, in post-monsoon by 0.018° and in winter by 0.015°C between 1978–2007. The research also indicates that the average temperature of the Barisal region (which covers Patuakhali study district), Rajshahi, and Sylhet

(which represents Sunamganj study district) region was increased throughout 1978–2008. It is expected to continue. The predictions are that Bangladesh will experience an increase of 1.5°C by 2050 (World Bank, 2013). Regarding rainfall patterns, the most recent report indicates that the average rainfall may increase by 3.3 mm per year in monsoon and 8 mm per year in post-monsoon in Bangladesh. The same report indicates a negative trend in both winter and pre-monsoon. Some of the climatic and environmental variables such as temperature rise, excessive rainfall are the main factors for increasing vulnerability in households over the country. Temperature rise and excessive rainfall affect households' lives and livelihoods. Thus they moved from an unfavourable place to a favourable place.

Some studies found a positive association between asset loss and the decision to migrate (Rayhan and Grote, 2007; Paul, 2003). Some claimed that population pressure, landlessness, and unemployment in the rural areas forced people to settle down in the risky areas, making them more vulnerable to climate change and environmental degradation (Islam, 1992).

Some studies found, "increases in the frequency and intensity of tropical cyclones in the last 35 years can be attributed in part to global climate change" (Emanuel 2005, Webster et al., 2005 and Bengtsson, Roger and Roeckner 2006 cited in World Bank, 2010:4). World Bank projected that another 7 million coastal people will confront cyclones by 2050 because of the changing climate. The total number of damaged houses will increase to 1.6 million because of cyclones induced by climate change. Bangladesh will continue to encounter climate change because of the rising sea level and the melting ice caps (ice mass consisting of less than 50,000 square kilometres). Moreover, the warmer ocean will bring in more intense cyclone activity (World Bank, 2010).

Cyclone Bijli displaced 200,000 people. The last devastated cyclone Aila, which hit the country in May 2009, displaced 76,478 Satkhira and Khulna districts (International Organization for Migration, 2010). However, the New York Times (May 25, 2009) reported that "In coastal Bangladesh, emergency officials, moved about 500,000 people to temporary shelters after they left their homes to escape tidal waves churned by high winds."

Ninemonths after Aila, around 200,000 people were still reported to be homeless. Initially, people moved out to the nearby areas, returned after a while to their homes. A vast majority became seasonal migrants, as they feared no employment opportunities would be available for them in the surrounding areas (International Organization for Migration, 2010).

Islam (2004) also mentioned that almost 9,00,000 people died owing to catastrophic cyclones throughout the last 35 years. The Noakhali and Chittagong received 40 % of the cyclones, which is the most vulnerable area for the landfall

of cyclones. The Chittagong and Cox's Bazar coast received around 27 %, whereas Khulna -Sundarban and Barishal-Noakhali cost are relatively less susceptible (Rahman, 2001).

From data of the last 100 years, it has been observed that the surface temperature has increased by between 0.4 C and 0.80C (New Age, 2007). The average temperature rise in Bangladesh has been predicted to be 10C by 2030 and 1.40C by 2050. Such increased temperatures will intensify droughts in the future in susceptible areas. A total of 19 droughts occurred over the 31 years from 1960 to 1991. They affected about 47% of the area and 53% of its population (Ali, 2007).

Zaman (1989) states that 88 percent of migrant agricultural communities in Bangladesh remained within two miles of their previous residence following land erosion and loss of homes due to flooding. Similar trends were found on cyclone response too. Such rapid-onset disasters lead to temporary displacement to nearby areas as people lack resources to move farther, and many return and reconstruct their homes (Piguet, 2011). Besides, people prefer to stay with family and friends, are linked to social networks (Barnet and Weber, 2009), and live in ways familiar to them (Perch-Nielson et al., 2008). However, it may be noted that migration is not always a primary response to a disaster, mainly when emergency aid compensates for damage (Kniveton et al., 2009). Often seasonal and circular migration is an essential livelihood option that helps communities gather resources from their destination while offsetting the resource pressure back home. Movement induced by climate change is likely to be short-term and occur internally over short distances, especially in low-income countries (Sward and Codjoe, 2012; Gemenne, 2011).

Internal migration to urban areas is showing a sharp increase (Planning Commission, 2010). An estimated half a million people move to cities every year, mainly from coastal and rural areas. Income diversification is the primary driver for this group of migrants (Islam, 2012).

Bangladesh has received floods every three years for the last twenty years, and affected people do not defer their migration decisions because the risk increases if a repeated flood occurs in the same land (IOM, 2010). Rayhan and Grote (2007) reported that at least one member migrated permanently from one-fourth of the households. Out of five households, four households' members left their homes because of unemployment due to repeated floods, which took place in the area. Approximately 89 percent of them migrated to urban areas. Only a few, six percent migrated to other rural areas, and five percent migrated to another country.

Millions of people in the coastal areas of Bangladesh are under threat of climate change and climate variability issues. According to Rabbani (2009), more than 35 million people will be displaced from 19 coastal districts of Bangladesh in case of a 1-meter sea-level rise in this century. IOM (2009) indicated in a study that many people have already migrated to the urban slums from the coastal zones of Bangladesh due to frequent cyclones, storm surges, river erosion.

The Cyclone Aila, which hit coastal Bangladesh on May 25, 2009, caused a massive loss of properties and infrastructure and displaced many people from their homes (DMB, 2009). The coastal embankments damaged by the cyclone and tidal surges could not be repaired even after one year (Oxfam, 2010).

The coastal areas are particularly vulnerable to tropical cyclones and associated storm surges. In 1970, 1985, 1991, 1997, 2007, and 2009 caused huge losses and displaced millions of people in the coastal areas (Akter, 2009).

In 2009, during Cyclone Aila in Bangladesh, 190 people were killed, and around 4.82 million people were affected in 11 coastal districts (Leighton et al., 2011). Based on the Ministry of Disaster and Management and Relief (MDMR, 2013), the central city districts, especially Dhaka, are common destinations for people displaced by disasters.

IOM (2010) states that land lost to sea-level rise will reduce agricultural productivity and erode agricultural employment, eventually causing many to migrate. Other recent research conducted by the Comprehensive Disaster Management Programme (CDMP) in 2014 under the Ministry of Disaster Management and Relief takes note of the four internal displacement factors (river erosion, flooding, waterlogging, and salinity) and the ways that they manifest in internal displacement in Bangladesh (CDMP, 2014). It is more immediately evident in the coastal areas because of the rising sealevel. However, the CDMP initiated study limits its focus to displacement only, excluding the situation of people who might voluntarily choose to migrate. In the same way, Shamsuddoha et al. (2012) state that Cyclone Aila displaced around 300,000 people from the coast of Bangladesh.

Shamsuddoha et al. (2012) highlight the different ways environmental processes displace people. Displacement arising from sudden-onset disasters is often immediate. In contrast, in the context of slow-onset disasters, people's environment and livelihoods are gradually affected, compelling people to first undertake economic migration, which might initially be temporarily or seasonal, followed later by permanent migration. In the study, people who had better financial, social, and human capital tended to approach migration in a more planned manner, while the poor and vulnerable who had fewer or no options were

displaced or remained trapped in vulnerable locations. Foresight (2011) reported echoed the same concern for trapped populations on a global scale. It discusses environmental migration, global migration trends, particularly internal migration in low-income countries, and projects that millions of people will be trapped in areas vulnerable to environmental change in future decades.

Research Methods

The study is mainly based on primary data collected through interviews using a structured questionnaire covering 450 households from the three exposed coastal Upazilas, namely Ukhiya, Sarankhola, and Char Fason of Bangladesh. The sample units have been selected by the multi-stage cluster random sampling method. The number of household heads from each village is 150. Data were collected from July to September 2018. By using SPSS and MS- Excel, the data have been analysed. Both descriptive statistical analysis and econometric analysis, the Logistic regression model, have been used to analyse and interpret the data.

Findings and Discussion

The primary reason behind migration in the coastal areas of Bangladesh: To estimate the influencing factors behind migration, the empirical logit model can be written as,

$$Y = \beta_0 + \beta_1 X + \mu$$

Where Y is the migration status (1 = Respondents who migrate, 0 = Respondents who do not migrate), β_0 is the Y-intercept, whereas β_1 is a coefficient to be estimated. X is the explanatory variable that represents the primary reasons behind migration.

The simple Binary Logistic regression has been used to investigate the relationship between migration and significant reasons behind migration in the coastal areas of Bangladesh. To run logistic regression, it is essential to ensure that there is a relationship between two variables. For that reason, at first, it is required to check the cross-tabulations or Chi-Square test. Here, the independent variable is categorical, so starting by running cross-tabulations and checking the Chi-Square test is required.

1. Cross tabulation and Chi-Square Test: The cross-tabulation shows a relationship between the two variables. From the result, it is found that the value of Chi-Square is 17.537, and it is significant. So, there is a relationship

exist between migration and the significant reasons behind migration. The tables are shown in the appendix. The Logistic regression model can estimate migration as the dependent variable and significant reasons behind migration as the categorical independent variable.

2. **Logistic Regression:** From the result, it shows that migration ("Yes") is coded as one (1) and not migration ("No") is coded as 0. The Categorical Variables Coding table shows that the six main reasons behind migration have been re-coded in the logistic regression as dummy variables. In logistic regression, there are comparing groups to each other. In order to make a comparison, one group has to be omitted from the comparison to serve as the baseline. In the study logistic regression, "Lack of job opportunities" has been selected as the baseline (or constant) dummy variable to which it will compare the predictions for "Economic Insolvency," "Climatic Vulnerabilities," "Social Problems," "Education" and "Lack of health care facilities." Therefore, "Lack of job opportunities" will not be included in the model. It is also present in the appendix.
3. **The Omnibus Tests:** The omnibus Tests of Model Coefficients are used to check that the new model (with explanatory variables included) is an improvement over the baseline model. It uses chi-square tests to see a significant difference between the Log-likelihoods (specifically the -2LLs) of the baseline model and the new model. If the new model has a significantly reduced -2LL compared to the baseline, it suggests that it is explaining more of the variance in the outcome and is an improvement. The Omnibus Tests of Model Coefficients output table shows the results of a Chi-Square test to determine whether the main reasons behind migration significantly influence migration. The Chi-Square has produced a p-value of 0.11, making the migration status model significant at the 5% level. Here, the Chi-Square is highly significant (Chi-Square = 14.772, df = 5, p = 0.011) so the model is significantly better.

Here, there are three different versions; Step, Block, and Model. The Model row constantly compares the new model to the baseline. The Step and Block rows are only crucial if adding the explanatory variables to the model in a stepwise or hierarchical manner. If it is building the model up in stages, these rows would compare the -2LLs of the newest model with the previous version to ascertain whether or not each new set of explanatory variables was causing improvements. In this case, it has added all seven explanatory variables in one block and therefore has only one step. It means that the chi-square values are the same for step, block, and model. The Sig. values are p =

- .011, which indicates the accuracy of the model improves when it adds explanatory variables.
4. **Model Summary:**The ModelSummary (Table 6) provides the -2LL and pseudo-R² values for the entire model. The -2LL value for this model (377.598) is what was compared to the -2LL for the previous null model in the 'omnibus test of model coefficients, which told there was a significant decrease in the -2LL, i.e., that the new model (with explanatory variables) is a significantly better fit than the null model. The R² values tell us how much variation in the outcome is explained by the model (like in linear regression analysis). Nagelkerke's R² suggests that the model explains roughly 5.5% of the variation in the outcome. From the result, it is found that the model is correctly classifying the outcome for 84.2%. It is shown in the appendix.
 5. **The Variables in the Equation Output:**This table provides the regression coefficient (B), the Wald statistic (to test the statistical significance), and the all-important Odds Ratios (Exp(B)) for each variable category. Table 1 shows the Variables in the Equation output table. At first, it is required to check the significance level. From the table, it is found that reason (1) or "Economic Insolvency" has a p-value of 0.034, making it significant at the $p < .05$ level, and this reason has a positive and robust effect on the dependent variable. Migration is influenced by economic insolvency. One unit increase in economic insolvency leads to an increase in the odds of migration by 2.465 points. It can be explained by the fact that economic insolvency makes people vulnerable and when they migrate. This table (Table 1) also indicates that an economically insolvent respondent has odds of being migrated that are 2.465 of the odds of someone lacking job opportunities.

Table 1 also shows that reason (2), or "Climatic Vulnerabilities," has a p-value of 0.002, making it significant at the $p < 0.05$ level. The result indicates that Climatic vulnerabilities positively, strongly, highly representatively, and significantly affected the migration decision. A unit increase in climatic vulnerabilities increases the odds in favour of migration decision by 3.753 points. So, it can be said that an increase in climatic vulnerabilities hampers the living place, livelihoods, earning sources, assets, health, productivity and make people vulnerable. Lastly, vulnerable people decide to migrate from their own place to another place. It is also found that a climatically vulnerable respondent has odds of being migrated that are 3.753 of the odds of someone who lacks job opportunities.

From the table, it is observed that reason (3) or Social Problems ($p = .410$), reason (4) or education ($p = .797$), and reason (5) or lack of health care facilities ($p = .450$) have no significant impact on migration in the coastal areas of Bangladesh. Social Problems have a positive but insignificant impact on migration decisions. Suppose social problems rise in 1 unit, the odds in favour of migration decision rise by .478 points. However, it has no significant impact on migration decisions.

Education also has a positive sign but insignificant impact on migration decisions. One unit increases education, increasing the odds in favour of migration decision by 1.196 points. However, this factor has no significant influence on migration decisions.

Another variable that has been taken as a determinant of migration is the lack of health care facilities, and it also has an insignificant impact on migration. However, its signs are also positive. If the lack of health care facilities rises by 1 unit, then the odds in favour of migration decision rises by 2.391 points. However, it has no significant impact on migration decisions.

Climatic Factors and their Effects on Migration: Bangladesh is heavily impacted by manifestations of climate change. These are prevalent across the

Table 1: Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
Step 1 ^a	Reason		15.616	5	.008			
	reason(1)	.902	.425	4.514	1	.034	2.465	1.072 5.666
	reason(2)	1.322	.422	9.839	1	.002	3.753	1.642 8.574
	reason(3)	-.738	.895	.679	1	.410	.478	.083 2.764
	reason(4)	.179	.696	.066	1	.797	1.196	.306 4.678
	reason(5)	.872	1.155	.570	1	.450	2.391	.249 23.009
	Constant	.738	.367	4.048	1	.044	2.091	

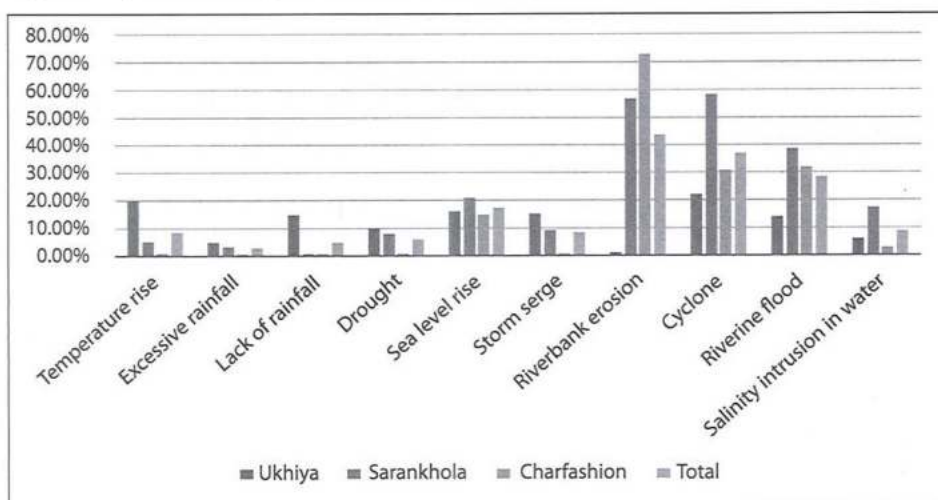
a. Variable(s) entered on step 1: reason.

country at different geographical locations affecting lives and livelihood opportunities, particularly in the most vulnerable coastal region. Though the three study locations are affected by several natural hazards exacerbated by climate change, the effects are more intense in some areas than others. In order to assess the impact of climate change and environmental degradation on migration, the

respondents of the study areas were asked to identify some significant natural hazards that influenced their decisions to migrate.

The respondents from Ukhiya mentioned significant hazards that influence their migration decisions are temperature (20%), cyclone (22%), and lack of

Figure 1: Major climatic change and environmental hazards that contribute to migration decisions



rainfall (14.67%). In Sarankhola, cyclones were identified by nearly 59 percent of the participants as primary reasons for migration, riverbank erosion by 57.33percent, riverine flood by 38.67 percent, and sea-level rise 20.67 percent, and salinity intrusion in water by 17.33 percent of respondents. In Char Fason, riverbank erosion was identified by 73 percent of the respondents as the primary reason for migration. They also identified riverine floods by 32 percent, cyclones by 30.67 percent, and sea-level rise by 14.67 percent as the main reasons for migration. From the data, it is observed that riverbank erosion (44%), cyclone (37.11%), riverine flood (28.22%), sea-level rise (17.11%), and salinity intrusion in water (8.67%) are the primary driver of migration in the coastal areas of Bangladesh. Besides, temperature (8.44%), excessive rainfall (2.67%), lack of rainfall (4.89%), drought (6%), and storm surge (8.22%) are the factors that affect migration decisions.

Conclusion

The study has provided an experimental evaluation for the main reason behind migration in the coastal areas of Bangladesh. In line with existing literature, this study finds that climate vulnerability has a negative and significant relationship with migration in Bangladesh. The study found that the significant reason behind

migration is climatic vulnerabilities, which is 51.11%, and then is economic insolvency (35.56%) in the coastal areas of Bangladesh. From the empirical analysis, it is also found that economic insolvency and climatic vulnerabilities have a significant impact on migration, and on the other hand, the remaining factors have an insignificant influence on migration. One unit increase in economic insolvency leads to an increase in the odds of migration by 2.465 points. A unit increase in climatic vulnerabilities increases the odds in favour of migration decision by 3.753 points. The study also identified significant natural hazards such as riverbank erosion, cyclone, riverine flood, and salinity intrusion in water that influenced respondents to decide migration. As a result, many people move from their region to other regions to seek a better life and livelihood.

Limitation

Following limitations are noted in conducting the research-

- i. It is tough to communicate with the selected households because of the poor communication system in the coastal areas.
- ii. Coastal people are mostly illiterate. They are not always agreeing to provide information that was required for the study

Recommendations

The study suggests the following recommendations for the policymakers and researchers as well-

- i) An Internal Migration and Relocation Policy needs to be developed as part of an effective adaptation and development strategy.
- ii) Institutional arrangements to manage internal, seasonal, temporary, and forced migration is urgent.
- iii) Develop skills of the potential migrants so that they can acquire decent jobs in the regions of destination.

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Appendix

Table 1: Cross table of Migration decisions by the respondents and major reasons behind migration.

Migration decision by the respondents	Major reasons behind migration						Total
	Economic	Climatic	Social Problems	Education	Lack of health care facilities	Lack of job opportunities	
	Insolvency	Vulnerabilities					
No	26	26	3	4	1	11	71
Yes	134	204	3	10	5	23	379
Total	160	230	6	14	6	34	450

Table 2: Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.536 ^a	5	.004
Likelihood Ratio	14.772	5	.011
Linear-by-Linear Association	7.547	1	.006
N of Valid Cases	450		

a. three cells (25.0%) have an expected count less than 5. The minimum expected count is .95.

Table 3: Categorical Variables Coding

		Frequency	Parameter coding				
			(1)	(2)	(3)	(4)	(5)
Main reasons behind migration	Economic Insolvency	160	1.000	.000	.000	.000	.000
	Climatic Vulnerabilities	230	.000	1.000	.000	.000	.000
	Social Problems	6	.000	.000	1.000	.000	.000
	Education	14	.000	.000	.000	1.000	.000
	Lack of health care facilities	6	.000	.000	.000	.000	1.000
	Lack of job opportunities	34	.000	.000	.000	.000	.000

Table 4: Omnibus Tests of Model Coefficients

		Chi-square	Df	Sig.
Step 1	Step	14.772	5	.011
	Block	14.772	5	.011
	Model	14.772	5	.011

Table 5: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	377.598 ^a	.032	.055

a. Estimation terminated at iteration number 5 because parameter estimates changed by less than .001.

Table 6: Classification Table

Observed		Predicted Migration decision by the respondents		Percentage Correct
		No	Yes	
Step 1	Migration decision by No the respondents	0	71	.0
	Yes	0	379	100.0
Overall Percentage				84.2

a. The cut value is .500

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In-text citation:

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Newspaper article (no author)

Reference list:

Little blue penguins homeward bound. (2011, November 23). *Manawatu Standard*, p. 5.

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Thesis (print)

Johnson, S. (2013). *Style strategies* (Master's thesis). UCOL, Whanganui School of Design, Whanganui, New Zealand.

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