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Abdul Jalil Pathan, Shahed Ahmed & Md. Humaun Kabir

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Nashia Zaman & G. M. Rashedul Islam

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Arifa Rahman & Md. Alamgir Hossain Bhuiyan

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Abul Barkat

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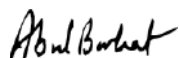
Editor's Note

The Bangladesh Journal of Political Economy (BJPE) accommodates only the selected papers submitted for publication, complying with the BJPE publication policies. Accordingly, this volume (Vol. 38, No.2, December 2022) of the Bangladesh Journal of Political Economy contains selected papers presented at the 21st Biennial Conference of the Bangladesh Economic Association and Regional Conferences (held in Mymensingh, Chattogram, and Rangpur), and papers submitted as part of the regular submission process.

Articles on this issue cover multifaceted areas of the political economy. The diverse areas include tax and income inequality vis a vis inclusive growth (by A J Pathan, S Ahmed and MH Kabir), the transformation of agricultural farming vis a vis farmer's livelihood (by I J Nishu, M S Rahman and S M M H Noman), worker's savings and safety (by M A Islam and A K M A Patwary), development impact of agricultural policies (by MS Rahman, RA Juice and M M F Shuvo), opportunities and challenges of spatial Macroeconomy (by M Hasan and MA Habib), laws vis a vis non-performing loans of commercial banks (by S M A Zaker), NGOs vis a vis poverty reduction (by H Rahman and M A M Asad), microcredit and women's empowerment (by A Rahman and M A H Bhuiyan), father's role in reducing violence against children (by I Khan and SS Imtiaz), determinants of perceived insecurity among victims of crime (by Abonti Barkat), paradox of social changes (by Kamrunnahar and AK Ghose), new industrial revolution's lessons for Bangladesh (by N Zaman and G M R Islam), entitlement failure as disparity and struggle for justice (by A J Chowdhury), China's Renminbi as global currency (by M S Hossain and C Ara), and freshwater resources in agricultural sector (by Sayed Jubair Bin Hossain).

We hope that the accompanying Issue will be an essential resource for social science faculties and research institutions, development agencies, policymakers and analysts, graduate teachers, and researchers who intend to learn about the political economy of development.

We express our indebtedness to the authors, reviewers, members of the Editorial Board, and others who have contributed to raising the standard of this issue.



Abul Barkat, *PhD*
Editor, Bangladesh Journal of Political Economy;
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Contents

1. Impact of High Tax Gap and Low Tax-GDP Ratio on Income Inequality in Bangladesh: Emphasizing Inclusive Growth
Abdul Jalil Pathan, Shahed Ahmed & Md. Humaun Kabir 1
2. Transformation of Rice Farming to Commercial Farming in Mymensingh: An Empirical Evidence Based on Farmer's Livelihood Patterns
Ismat Jerin Nishu, Md. Saidur Rahman & S M Mehedy Hasan Noman 25
3. Whether Relaxation in Law is the Main Reason for Increasing Non-Performing Loans of Commercial Banks of Bangladesh
S. M. Abu Zaker 53
4. Assessing Savings Position for Financial Safety of Ready Made Garments Workers in Bangladesh
Md. Aynul Islam & A K M Asaduzzaman Patwary 71
5. Role of an NGO in the Poverty Reduction of the Char Dwellers in Kurigram District, Bangladesh
Habibur Rahman & Md. Asaduzzaman Mandol Asad 99
6. Paradoxical Social Changes in Bangladesh
Kamrunnahar & Supad Kumar Ghose 115
7. Situating Bangladesh in the New Industrial Revolution: Adopting Lessons from Developed Countries
Nashia Zaman & G. M. Rashedul Islam 129
8. Evaluation of Agricultural Policies and its Impact on Agricultural Development in Bangladesh
Mohammad Saidur Rahman, R. A. Juice & Md. Mahir Faisal Shuvo 143

| | | |
|-----|--|-----|
| 9. | Determinants of Perceived Insecurity among Victims of Crime in Bangladesh <i>Abonti Barkat</i> | 175 |
| 10. | Entitlement Failures in Pakistan (1950-1971): A Tale of Disparity and Struggle for Justice <i>Ahmed Javed Chowdhury</i> | 199 |
| 11. | Dinajpur's Macroeconomic Landscape: Navigating Opportunities and Challenges <i>Mehedi Hasan & Md. Ahsan Habib</i> | 213 |
| 12. | China's Renminbi as a Global Currency: An Appraisal <i>Md. Sazzad Hossain & Chasme Ara</i> | 229 |
| 13. | Understanding the Role of Fathers in Rural Bangladeshi Households to Reduce Violence Against Children <i>Ishrat Khan & Sayed Saikh Imtiaz</i> | 243 |
| 14. | Empowerment of Rural Women through Microcredit Programme of BRAC <i>Arifa Rahman & Md. Alamgir Hossain Bhuiyan</i> | 261 |
| 15. | Freshwater Resources and the Agricultural Sector <i>Sayed Jubair Bin Hossain</i> | 297 |

Impact of High Tax Gap and Low Tax-GDP Ratio on Income Inequality in Bangladesh: Emphasizing Inclusive Growth

Abdul Jalil Pathan*
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Abstract

This study analyses the current challenges that Bangladesh's tax system is facing. It proposes policy recommendations to improve the tax-GDP ratio, reduce tax gaps, minimise income inequality, and promote inclusive growth. The study found that the Gini coefficient, Palma ratio, and Quintile ratio have increased due to the regressive nature of VAT, along with under-reporting, mispricing, high tax rates, excessive tax exemptions, money laundering, tax evasion, and a rigid tax composition within Bangladesh. The challenges have become more complex as Bangladesh has transitioned from a Least Developed Country (LDC) status, with increased foreign interest rates and reduced grants putting a strain on fiscal resources. Against this backdrop, the study recommends comprehensive strategies to strengthen domestic revenue mobilisation, including diversifying the tax base and reforming VAT while improving tax compliance and governance frameworks to foster inclusive growth and mitigate income inequality. Resetting VAT classifications based on consumer classes to ensure social justice is a crucial policy intervention. Lastly, the study recommends vigilant monitoring of the undue nexus among political, business, and bureaucratic entities to combat illicit financial

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activities. These policy recommendations aim to create a more equitable and efficient tax system in Bangladesh, fostering economic development and improving the livelihoods of all citizens.

Keywords: *Tax Gap · Tax-GDP Ratio · Inequality · GINI Ratio · Inclusive Growth*

1.1 Introduction

The national budget is the pragmatic evidence of theoretical fiscal policy. Fiscal policy stimulates real GDP and employment, ensures price level stability, and redistributes income using fiscal instruments, taxation, public borrowing, public expenditure, and other revenues to achieve desired macroeconomic goals.

Bangladesh has achieved global attraction in rigorous economic development and persistent GDP growth except for 2020-21 for COVID-19 deterioration. The annual growth rate of GDP has been 6.5 (approx.) percent for the last ten years, 7.5 (approx.) percent over the previous four years, and 2.38 percent in the 2020-21 fiscal year for the COVID-19 pandemic (Bangladesh Economic Review, 2022). In contrast, according to World Bank data, the gross fiscal deficit is 6.8 percent of GDP in the same period in Bangladesh. It is graduating over LDCs, now in lower-middle-income countries and on the way to developing countries by 2026.

Bangladesh emerged as a new Asian tiger with the 42nd largest GDP and committed to placing itself in a developed club within 2041. HSBC research shows Bangladesh will be the 26th largest GDP by 2030. According to the UK's Centre for Economics and Business Research (CEBR), Bangladesh will place 41st in 2022, 34th in 2026, 29th in 2031, and 24th largest economy within 2036. During this duration, it will cross to countries like Malaysia, Singapore, Denmark, Hong Kong, UAE, Egypt, Norway, Argentina, Israel, Iceland, Austria, Belgium, Sweden, and Taiwan.

Bangladesh achieved MDGs (Millennium Development Goals in 2015) and is on the way to achieve SDGs (Sustainable Development Goals by 2030) and targeted delta plan by the 21st century. Instead, problems and challenges are unlimited for Bangladesh which Myanmar forced Rohingya crisis, COVID-19 deterioration, persistent unfavourable balance of payment, increased public debt, local and foreign, increased debt servicing payment, inflationary pressure, limited diversification in exportable goods and services, natural calamities and climatic change, inequality and corruption, lack of practical education, gender discrimination, and unemployment. To mitigate all the problems, challenges, and prospects, Bangladesh should undertake a big volume fiscal budget, but our capability is not satisfactory as per requirement. That is why excessive expenditures create a fiscal deficit.

Fiscal deficit financing largely depends on internal and external borrowing,

which incurs huge debt servicing payments, and the deficit status worsens to more deficit. The question is why there is such a big deficit. This issue has been focused on in recent years, and much debate has been held among politicians, academicians, researchers, policymakers, and practitioners in Bangladesh.

In Bangladesh, only around 24 lakhs (2.4 mil.) people return their tax file out of the around 50 lakhs (5 mill.) registered TIN holders, which is slightly over 1% people pay income tax out of the around 18 crores (180 mill.) people and 45,000 companies out of 213,505 registered companies with the Registrar of Joint Stock Companies (RJSC) submitted tax returns in FY 2019-20 according to NBR.

The government is implementing measures to tackle tax evasion and increase compliance, aiming to achieve its goal of becoming a developed country by 2041 despite challenges such as an unfavourable balance of payment, mounting public debt, and limited diversification in exportable goods and services. To prevent adverse macroeconomic consequences like inflationary pressures, the balance of payment crisis, and debt spiralling, the government is taking steps to manage fiscal deficit financing effectively.

The scenario of direct tax is 31.88%, and another 68.12% is an indirect tax, equally levied on poor and rich people with double taxation regressively. At the same time, tax exemption records 2.28% of GDP, and miss-invoicing is 17.95% of total trade. That is why the tax gap is 7.5%, the highest among 17 Asia-Pacific countries according to the 2018 report of the United Nations Economic and Social Commission for Asia and the Pacific, and the Tax-GDP ratio is 8.9%, the lowest in South Asian countries.

According to the latest World Bank data, developing countries' average tax-GDP ratio is 25.60%, the OECD average is 35%, and the world average is 15.34%. All these scenarios indicate high inequality. The inequality measuring indicator Gini coefficient value was 0.483 in 2018 in Bangladesh, where 0.40 is alarming. Before the COVID-19 epidemic, Bangladesh attained an average annual GDP growth rate of 6.5%. At the same time, the magnitude of inequality also rose, which indicates exclusive growth and the decline of the rights of poor people in society.

Fiscal deficits can be financed through domestic, foreign, or printing money. Excess use of any particular mode of financing of the fiscal deficit has adverse macroeconomic consequences; Viz, seigniorage financing of fiscal deficit can create inflationary pressures in the economy, bond financing of fiscal deficit can lead to a rise in interest rates and turn into crowd-out private investment and the external financing of fiscal deficit can spill over to balance of payment crisis and appreciation of exchange rates and in turn debt spiralling. A large fiscal deficit can sometimes adversely affect the country's economic growth. So, domestic resource mobilisation effectively is a situation demand ahead of LDC graduation,

minimising budget deficit expenses on borrowing and making a self-reliant country. To make an equitable and justified nation, we need effective tax composition with robust compliance and governance to accelerate inclusive growth. The study reveals the impact of the high tax gap and low tax-GDP ratio on income inequality, emphasising inclusive growth in Bangladesh.

1.2 Rationale of the Study

Bangladesh has been a deficit-budgeting country since its independence. Tax is a crucial instrument of fiscal policy, and one of its most important roles is to redistribute income and minimise income inequality. Every fiscal year, we pay huge debt servicing against our internal and external borrowing, sometimes creating inflationary pressure. Last decade, we achieved an annual average of 6.5% GDP growth rate, but our tax gap is very high, and the tax-GDP ratio is constantly hovering around 7%-9%. Tax exemption, tax evasion, mispricing, money laundering, and VAT are under-reporting, causing a big tax gap and a low tax-GDP ratio, which is why we earn very little tax revenue compared to our GDP. The government cuts back on spending on relevant capital goods sectors like health, education, and infrastructure due to high government borrowing and high debt servicing. Moreover, around 70% of our tax collection is from VAT; this is regressive and imposed equally upon the rich and poor, resulting in chronic income inequality in Bangladesh. So, detecting the causes of overall tax exemption and tax evasion resulting in a high tax gap and low Tax-GDP ratio and their impacts upon income inequality and finding perfect tax composition through domestic resource mobilisation for making an equitable and justified nation by inclusive growth is a demand of the time.

1.3 Literature Review

We have carefully studied the literature to identify clues and research gaps relevant to our research problem. Below is a summary of our findings:

Islam, Rashid, Hossain, and Hashmi (2020) conducted a study on the impact of economic and non-economic public policies on tax evasion. They reported that countries with higher degrees of economic freedom, such as property rights, monetary freedom, fiscal freedom, and investment freedom, tend to experience lower levels of tax evasion. They also found that countries with better public sector governance and higher religiosity have lower tax evasion rates. They suggested that governments, tax authorities, and researchers consider these insights when developing public policies to reduce tax evasion.

Thilanka and Ranjith (2021) studied the effect of tax composition and compliance on income inequality. They discovered that direct taxes have a negative

impact on income inequality, while indirect taxes, such as VAT and tax non-compliance, have a positive impact. They recommended that countries broaden their income tax base and strengthen tax compliance measures to reduce income inequality.

Traore (2019) investigated the impact of tax policy on inclusive growth in 91 developing countries from 1990 to 2015. He found that reliance on the progressivity of personal income tax has been a source of inclusive growth and income distribution. He also found that corporate income tax may be a greater source of inclusive growth only if the country has strong institutional quality, such as low corruption and good bureaucratic policy. Additionally, his research revealed that the effect of tax on inclusive growth is affected during electoral periods.

Fuest and Riedel (2009) showed that tax avoidance and tax evasion are major limiting factors to revenue mobilisation in developing countries. They identified two components: the domestic component, which includes tax evasion due to the domestic shadow economy, and the international component, which provides profit shifting by corporations and private individuals' offshore holdings of financial assets.

Khaled (2021) conducted a study on the causes of Bangladesh's lower tax-GDP ratio and the psychological impact of tax evasion. He found a link between the lower tax-GDP ratio and the psychological impact of a historically long colonial rule. The citizens' psychology has been developed so that revenue collected by the government is smuggled elsewhere.

Isabelle, Pisu and Bloch (2012) explore the diversity in redistributive impact across OECD nations, highlighting the significance of factors like tax progressivity and welfare system size. Employing empirical analysis, they categorise countries into groups based on their tax and transfer systems, offering valuable insights into combatting income inequality.

Joumard, Pisu and Bloch (2013) pinpointed the redistributive impact of primary taxes and cash transfers in mitigating inequality in disposable income compared to market income across diverse OECD countries.

Finally, Murshed and Saadat (2018) revealed that political stability and the existing public service conditions positively impact the tax-GDP ratio.

1.4 Research Gaps

Several potential research gaps were identified based on the provided literature review and the focus of the study. Research gaps in the context of Bangladesh's tax system include understanding the effectiveness of specific tax policies in addressing income inequality, exploring the influence of socioeconomic factors on tax compliance, assessing the impact of tax policies on inclusive growth, examining

the dynamics of tax avoidance and evasion, and investigating the psychological factors influencing tax behaviour. Addressing these gaps can provide valuable insights for policymakers aiming to design targeted tax reforms to foster inclusive economic development, improve tax compliance, and mitigate income inequality in Bangladesh.

1.5 Objectives of the Study

This study aims to examine the impact of the high tax gap and low tax-GDP ratio on income inequality in Bangladesh and propose an inclusive growth-oriented tax policy to promote equity within the economy.

The specific objectives of this study include:

- To illustrate the historical and current trends of Bangladesh's tax gap, tax-GDP ratio, and income inequality.
- To identify the factors contributing to Bangladesh's elevated tax gap and diminished tax-GDP ratio.
- To analyse inequality using metrics such as the Gini coefficient, Palma ratio, and Quintile ratio.
- To investigate the relationship between the Inverted-U hypothesis and the Laffer curve within the context of Bangladesh's economy.
- To introduce the Cobham approach to assess the tax gap.
- To examine the potential impact of VAT-based improvements on the Tax-GDP ratio on income inequality.
- To explore the concept of an inclusive growth-friendly tax policy tailored to the context of Bangladesh.

We are concluding the study and offering policy recommendations based on the findings.

2.0 Methodology of the Study

The article's methodology involves a comprehensive approach to examining the impact of the high tax gap and low tax-GDP ratio on income inequality in the Bangladesh economy, focusing on proposing an inclusive growth-oriented tax policy. Secondary data covers the period from 2000 to the 2021 fiscal year. Descriptive statistics are employed for data analysis, supplemented by trend line analysis to illustrate the historical and current trends of tax-related indicators and income inequality measures. Data is sourced from diverse national and international outlets, including Bangladesh Bank, Bangladesh Economic Review, World Development Indicators (WDI), World Bank, and Bangladesh Bureau of Statistics. Relevant literature is reviewed to provide theoretical insights into tax evasion, tax composition, inclusive growth, and the relationship between tax

policies and income distribution. The study utilises a structured methodology to analyse the research objectives, employing established economic principles and methodologies to derive meaningful conclusions and policy recommendations. By following these methodological steps, the article can effectively analyse the impact of tax policies on income inequality in Bangladesh and propose evidence-based policy recommendations to promote inclusive growth and equity within the economy.

2.1 Theoretical and Conceptual Framework

The conceptual framework of the article is grounded in the interplay between Bangladesh's tax system, economic development, and income inequality, focusing on promoting inclusive growth. At its core, the framework acknowledges that fiscal policy, including taxation, plays a pivotal role in shaping macroeconomic outcomes and social equity. The framework identifies critical components:

- **Tax System Dynamics:** The framework recognises the structure and composition of Bangladesh's tax system, emphasising the predominance of indirect taxes like VAT and the challenges posed by tax exemptions, evasion, and under-reporting. It acknowledges the impact of tax policies on revenue generation, economic incentives, and income distribution.
- **Economic Development and Fiscal Policy:** The framework situates Bangladesh's economic development trajectory within the context of fiscal policy, recognising the country's transition from a Least Developed Country (LDC) status to a lower-middle-income status. It considers the implications of economic globalisation, foreign aid, and trade dynamics on tax revenue sources and fiscal sustainability.
- **Income Inequality and Inclusive Growth:** The framework acknowledges the existence of income inequality in Bangladesh and its implications for social cohesion and economic stability. It underscores the importance of inclusive growth to address income disparities and promote equitable development. This includes enhancing access to education, healthcare, and infrastructure and creating opportunities for marginalised groups. Income inequality is measured by different ratios such as:

Gini Coefficient: The Gini coefficient ranges from 0 to 1. It indicates that the higher the Gini coefficient, the greater the inequality between a country's richest and poorest people. It is often written as a percentage. A Gini coefficient value approaching 40 (0.40) indicates that inequality is alarming in a society where the minimum population gradually gains the maximum wealth.

Palma Ratio: The Palma ratio compares the income of the richest 10 percent of the population in an economy with that of the bottom 40 percent. It measures the richest 10 percent of the population's share of the Gross National Income (GNI) divided by that of the poorest 40 percent.

Quintile Ratio: The Quintile ratio compares the income of the richest 20 per cent of the population in an economy with the bottom 20 per cent. The quintile ratio measures the total income received by the 20 per cent of the population with the highest income (the top quintile) to that received by the 20 per cent of the population with the lowest income (the bottom quintile).

Inclusive Growth: Inclusive growth is growth that benefits all portions of society, including the poor, middle-income groups, and even the wealthy, with equal opportunities.

- **Policy Interventions and Governance:** The framework identifies policy interventions to address the challenges within Bangladesh's tax system and promote inclusive growth. This includes diversifying the tax base, reforming VAT, improving tax compliance, and strengthening governance mechanisms to ensure transparency and accountability in revenue collection and expenditure.
- **Calculation of Tax-Gap:** Cobham (2005) discusses the estimation of tax revenue losses due to tax evasion, mainly focusing on the domestic shadow economy. Here's a breakdown of the approach and key points:

Tax Revenue in the Absence of Tax Evasion (T_0): Cobham starts by defining the hypothetical tax revenue of a country in the absence of tax evasion, denoted as T_0 , which is calculated as the product of the average tax rate (t) and the tax base (Ω). $T_0 = t\Omega$.

Where t is the average tax rate, and Ω is the tax base.

Reasons for Tax Revenue Losses: Cobham identifies five main reasons for tax revenue losses:

- ❖ Domestic shadow economy
- ❖ Foreign asset holdings of domestic residents
- ❖ Income shifting by multinational firms
- ❖ Tax competition leading to reduced tax rates
- ❖ Non-payment of taxes due to various reasons, such as shortcomings in tax administration.

Tax Revenue in Presence of Tax Evasion (T_1): In the presence of tax evasion, the actual tax revenue (T_1) is reduced due to the existence of the shadow economy. This is calculated using the formula:

$$T_1 = t\Omega (1-s)$$

Where s represents the share of the shadow economy, and official economy + shadow economy = 1; therefore, official economy = 1—shadow economy.

Tax Revenue Losses Due to Domestic Shadow Economy: Cobham defines the tax revenue lost due to activities in the domestic shadow economy as the difference between T_0 and T_1 , estimated as $t\Omega s$.

Cobham then defines the tax revenue lost due to domestic shadow economy activities as follows:

$$\text{Therefore, Tax Gap, } T_0 - T_1 = t\Omega s$$

Estimation of Tax Revenue Losses: Cobham estimates the tax revenue loss using the formula:

$$\text{Est}[T_0 - T_1] = \text{Tax revenue to GDP ratio} \times \text{GDP} \times \text{Share of the Shadow Economy in GDP.}$$

Cobham (2005) hypothesises that the shadow economy in developing countries constitutes just over 30% of the official GDP, while in developed countries, it constitutes around 13% of GDP. Cobham acknowledges limitations in estimating tax revenue losses, particularly in the case of the shadow economy, which includes illegal activities. Taxing these activities may not be feasible, and taxing them could potentially lead to changes in behaviour, reducing the tax base.

Overall, the conceptual framework provides a holistic understanding of the complex interactions between Bangladesh's tax system, economic development, and income inequality, offering insights into potential policy solutions to foster inclusive growth and equitable development.

3.0 Linking Inverted-U hypothesis and Laffer curve in Bangladesh economy

High tax evasion and extensive tax exemptions in Bangladesh inevitably lead to a significant tax gap and a low Tax-GDP ratio, contributing to widespread inequality and injustice. Both tabular and graphical methods are employed to elucidate the current state of the Bangladeshi economy concerning its tax structure. The table below provides a quantitative breakdown of critical indicators related to taxation,

while graphical representations offer visual insights into the patterns and trends within the tax system.

Table 1: Deficit budget and Tax-GDP ratio interaction

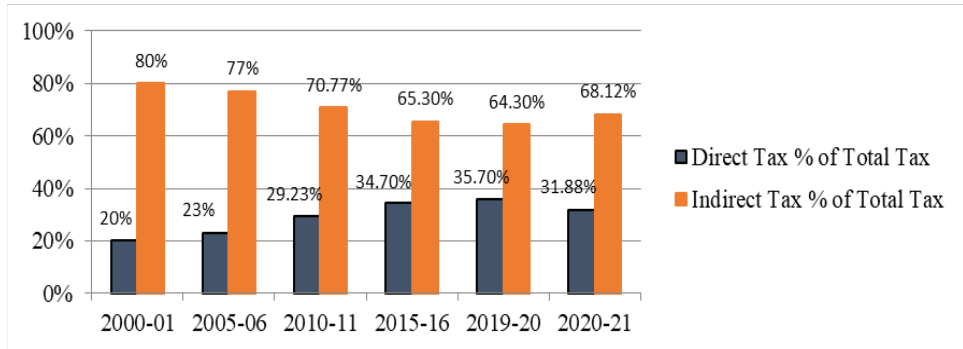
| Year | Deficit % of GDP | GDP Growth Rate | Per Capita GNI(US\$) | Tax-GDP Ratio |
|---------|------------------|-----------------|----------------------|---------------|
| 2000-01 | 2.92 | 5.29 | 440 | 6.611 |
| 2001-02 | 4.08 | 5.08 | 440 | 6.691 |
| 2002-03 | 2.74 | 3.83 | 440 | 6.965 |
| 2003-04 | 2.34 | 4.74 | 460 | 7.046 |
| 2004-05 | 2.62 | 5.24 | 510 | 7.136 |
| 2005-06 | 2.85 | 6.54 | 550 | 7.043 |
| 2006-07 | 2.57 | 6.67 | 570 | 6.917 |
| 2007-08 | 2.23 | 7.06 | 610 | 7.656 |
| 2008-09 | 4.03 | 6.01 | 660 | 7.498 |
| 2009-10 | 3.21 | 5.05 | 730 | 7.835 |
| 2010-11 | 2.68 | 5.57 | 800 | 8.686 |
| 2011-12 | 3.59 | 6.46 | 890 | 9.025 |
| 2012-13 | 2.98 | 6.52 | 970 | 8.962 |
| 2013-14 | 3.38 | 6.01 | 1040 | 8.635 |
| 2014-15 | 3.08 | 6.06 | 1110 | 8.498 |
| 2015-16 | 3.98 | 6.55 | 1220 | 8.765 |
| 2016-17 | 3.36 | 7.11 | 1370 | 8.9 |
| 2017-18 | 3.34 | 7.28 | 1520 | 9.4 |
| 2018-19 | 4.64 | 7.86 | 1750 | 8.9 |
| 2019-20 | 5.43 | 8.15 | 1930 | 8.45 |
| 2020-21 | 6% | 5.24 | 2064 | 7.9 |

Source: www.worldbank.org

Table 1 illustrates a substantial five-fold increase in per capita Gross National Income (GNI) during the fiscal years of 2020-21 compared to 2000-01. Correspondingly, the tax-GDP ratio slightly increased from 6.611 to just below 10. However, during this timeframe, there is a gradual escalation in the deficit alongside a rise in the growth rate. The question arises: How was such a growth rate achieved? The growth rate is sustained through borrowing from various national and international sources, resulting in significant debt-servicing costs

and exacerbating our budget deficits. Unfortunately, the significance of a robust tax administration is often overlooked. It's important to note that the values for 2020-21 across all indicators are abnormal due to the disruptive impact of the COVID-19 pandemic.

Figure 1: Contribution of direct and indirect tax in total tax revenue



Source: NBR, MoF, BBS

Indirect taxes are inherently regressive, disproportionately affecting lower-income and higher-income individuals. On the other hand, direct taxes tend to be progressive, meaning they impose a higher burden on higher-income individuals than on lower-income individuals. A regressive tax policy can exacerbate income inequality, whereas a progressive tax policy can help mitigate it.

Figure 1 illustrates that the proportion of indirect taxes is significantly higher than that of direct taxes in Bangladesh. However, there is positive news: both types of taxes move in inverse directions, meaning direct taxes increase while indirect taxes decrease. It's important to note that this trend was interrupted in 2020-21 due to the COVID-19 pandemic, which had unforeseen economic consequences.

This inverse movement suggests a potential shift towards a more progressive tax structure, which could help reduce income inequality in Bangladesh. However, continued efforts and policy interventions may be necessary to ensure that this trend persists and that the tax system contributes to a more equitable distribution of wealth and resources.

Table 2: Standard VAT Rates and Application of Reduced Rates in Some Selected Countries in 2021

| Country | Standard VAT/ GST Rates | Reduced Rates | Application of Reduced Rates |
|-------------|------------------------------|--|--|
| Australia | GST Rate 10% | - | Basic foods, Healthcare are GST-free. |
| Bangladesh | 15% | 10%, 7.5%, 5%, 2%, 0% | Goods exported and services imported are 0% |
| Canada | Federal GST Rate 5% | 0% | Healthcare, Child care, and Legal aid have exemptions |
| UK | 20% | 5% | Most food and children's clothes have 0% |
| USA | No VAT, Sales Tax 2.9%-7.25% | - | Lower rate in necessary goods varies in terms of Provinces. Basic foods, healthcare, pharmaceuticals, books, newspapers, domestic transport |
| Germany | 19% | 7% | Basic foods, healthcare, pharmaceuticals, books, newspapers, domestic transport |
| France | 20% | 5.5% | Small-scale enterprise and construction services have 3%. |
| China | 13%, 9%, 6% | 5%, 2%, 1.5%, 1%, 0.5% | Basic foods, postal services, books and newspapers have 0% |
| India | GST Rate 28%, 18%, 12% | 5%, 0% | Basic foods, healthcare, pharmaceuticals, books, newspapers, domestic transport |
| Japan | 10% | 8% | Some goods have exempted rate |
| South Korea | 10% | 0% | Some goods have exempted rate |
| Malaysia | 10% (Sales), 5% (Service) | 5% (Sales Tax) | Some goods have exempted rate |
| Pakistan | 17% | 1%, 1.5%, 2%, 5%, 7%, 7.5%, 8%, 10%, 16% | Goods exported and services imported are 0% |
| Russia | 20% | 10% | Foodstuffs, exports, and associated goods have reduced rate |

| Country | Standard VAT/ GST Rates | Reduced Rates | Application of Reduced Rates |
|-------------|----------------------------------|----------------|--|
| Myanmar | No VAT, Sales Tax average 14.38% | 8%, 5% | All exports are zero-rated, except electricity (8%) and crude oil (5%). |
| New Zealand | 15% | 9% | Exported goods and services have reduced Rate even 0% |
| Nepal | 13% | | 0% on exported goods |
| Sri Lanka | 8% (15% was in 2019) | | Exports and certain specified international services are 0% |
| Norway | 25% | 15%,11%, 6%,0% | Foodstuffs and e-books have reduced rate |
| Finland | 24% | 14%,10%,0% | Pharmaceutical products, domestic passenger transport, books (including e-books), and newspapers have reduced rates. |

Source: Global VAT Compliance

Table 2 provides an overview of the standard VAT rates, reduced VAT rates, and the application of various reduced rates in specific goods and services across different countries. While the standard VAT rates vary from country to country, many countries apply reduced rates, including 0% VAT, to essential items such as basic foods, healthcare, pharmaceuticals, books, newspapers, domestic transport, and sometimes to export and import goods and services.

Table 3: Tax gap and Tax-GDP Ratio Comparison by Asia Pacific Countries

| Country | Population | Tax Gap | Tax-GDP Ratio |
|-------------|--------------|---------|---------------|
| Bangladesh | 16.50 Crores | 7.50% | 9.1 |
| Bhutan | 7.70 Lakh | 6.70% | 16 |
| Afghanistan | 3.89 Crores | 6.20% | 7.6 |
| Maldives | 5.40 Lakh | 5.80% | 20.5 |
| Indonesia | 27 Crores | 4.70% | 11.5 |
| Pakistan | 22 Crores | 1.80% | 12.5 |
| China | 144 crores | 1.80% | 17.5 |
| India | 138 Crores | N/A | 18.08 |
| Malaysia | 3.30 Crores | 1.30% | 13.6 |

Source: World Bank, UN

Table 3 compares the tax gap and tax-GDP ratio among various Asia-Pacific countries based on data from the UN Economic and Social Commission for Asia and the Pacific Survey 2018. The tax gap represents the difference between actual and potential tax collection as a percentage of GDP. At the same time, the tax-GDP ratio indicates the proportion of tax revenue relative to the country's GDP. According to the table, Bangladesh has the highest tax gap among the 9 Asia-Pacific countries listed, with a tax gap of 7.50%. Bangladesh has the lowest tax-GDP ratio among these countries, except for Afghanistan, which stands at 9.1%. It indicates that Bangladesh's tax administration faces significant challenges in collecting taxes effectively and efficiently. Comparatively, other countries such as Bhutan and Afghanistan also exhibit relatively high tax gaps and low tax-GDP ratios, suggesting similar issues with tax administration and revenue collection efficiency. Overall, the data in Table 3 highlights the need for reforms and improvements in tax administration across the Asia-Pacific region to enhance revenue collection and promote economic stability and development.

Table 4: Tax Evasion Scenarios by CIC, NBR

| Year | Detection of taxes in million | Collection of taxes in million |
|---------|-------------------------------|--------------------------------|
| | Taka | Taka |
| 2015-16 | 1915.79 | 1205.81 |
| 2016-17 | 2159.89 | 1419.46 |
| 2017-18 | 2692.58 | 1106.2 |
| 2018-19 | 2524.95 | 1782.72 |
| 2019-20 | 2696.96 | 1680.05 |

Source: Yearly Success Report of Central Intelligence Cell (CIC), NBR

Table 4 presents data on the detection and collection of taxes in millions of Takas over five years, from 2015-16 to 2019-20. The figures reveal notable fluctuations and trends in tax enforcement and revenue collection during this period. In 2015-16, the detection of taxes amounted to 1915.79 million Taka, while the actual collection stood at 1205.81 million Taka. Over the subsequent years, the detection and collection of taxes experienced an upward trajectory. By 2016-17, the detection of taxes increased to 2159.89 million Taka, with the collection also seeing a rise to 1419.46 million Taka. However, in 2017-18, while the detection of taxes surged to 2692.58 million Taka, the collection declined significantly to 1106.2 million Taka, indicating a substantial gap between the detected and collected amounts. It's important to note that it happened in 2017-18 due to the COVID-19 pandemic. The trend continued in 2018-19, with the detection of taxes

slightly decreasing to 2524.95 million Taka, but the collection notably increased to 1782.72 million Taka, suggesting improved tax enforcement and compliance efforts.

Similarly, in 2019-20, although the detection of taxes remained relatively stable at 2696.96 million Taka, the collection decreased to 1680.05 million Taka. Overall, the data suggests varying levels of effectiveness in tax enforcement and revenue collection over the years, with fluctuations likely influenced by factors such as changes in tax policies, economic conditions, and the effectiveness of tax administration. Analysing these trends can provide insights into the efficiency of tax systems and inform future strategies for enhancing tax compliance and revenue mobilisation.

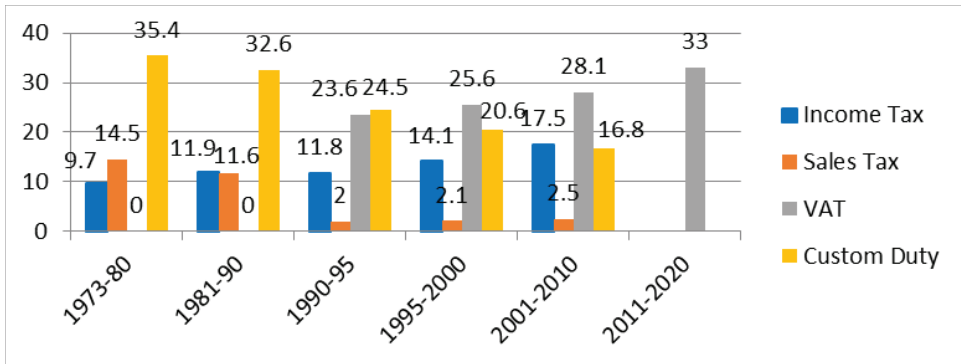
Table 5: Tax Evasion Scenario in terms of TIN Holder

| Year | Registered TIN Holder | Tax File Returnee |
|------|-----------------------|-------------------|
| 2018 | 35 Lakh | 19.5 Lakh |
| 2019 | 40 Lakh | 22 Lakh |
| 2020 | 50 Lakh | 24 Lakh |

Source: NBR

Table 5 indicates that nearly half of Bangladesh’s Taxpayer Identification Number (TIN) holders evade taxes, contributing to the decline in the tax-GDP ratio.

Figure 2: Tax Structure during Pre and Post-VAT Regime in Bangladesh



Source: Policy Research Institute (PRI), BD.

Figure 3 illustrates a significant reduction in sales tax and a decline in customs duty following the introduction of VAT during the 1990-95 regimes. The regressive nature of VAT applies equally to the affluent and the economically

disadvantaged. Moreover, a growing number of citizens are subject to income tax and VAT, reflecting a rising trend of income inequality in Bangladesh.

Table 6: Long-term Growth and Income Inequality

| Decade | Average annual growth rate (%) | Gini Coefficient (income distribution) |
|-----------|--------------------------------|--|
| 1970-1980 | 1.52 | 0.37 |
| 1980-1990 | 3.7 | 0.3 |
| 1991-2000 | 4.8 | 0.41 |
| 2001-2010 | 5.8 | 0.45 |
| 2011-2020 | 6.5 | 0.48 |

Source: Household Income Expenditure Survey (HIES), BBS

Table 6 presents data on the average annual growth rate (%) and the Gini coefficient (a measure of income distribution) for different decades in Bangladesh:

- 1970-1980: The average annual growth rate was 1.52%, and the Gini coefficient was 0.37. It suggests modest economic growth with relatively moderate income inequality.
- 1980-1990: The average annual growth rate increased to 3.7%, while the Gini coefficient decreased slightly to 0.3. This period saw a significant improvement in economic growth accompanied by a reduction in income inequality.
- 1991-2000: The average annual growth rate (4.8%) and the Gini coefficient (0.41) increased during this decade. Economic growth accelerated, but income inequality also rose, indicating that the benefits of growth were unevenly distributed.
- 2001-2010: The average annual growth rate increased to 5.8%, and the Gini coefficient rose to 0.45. Despite robust economic growth, income inequality worsened, suggesting that economic gains were concentrated among a smaller population.
- 2011-2020: This decade saw the highest average annual growth rate (6.5%) and a further increase in the Gini coefficient to 0.48. The period witnessed rapid economic expansion but also a significant exacerbation of income inequality, indicating that economic prosperity was not shared equally among all segments of society.

Overall, the data highlights the relationship between economic growth and income inequality in Bangladesh over the decades. While economic growth has generally

increased, income inequality has also risen, suggesting a need for policies to promote more inclusive growth and reduce disparities in income distribution.

Table 7: Income Group with Share of Total Income in Bangladesh

| Income Group | Variables | Dhaka City | Other urban | Rural | All Bangladesh |
|--------------|----------------------------|------------|-------------|-------|----------------|
| Bottom 40% | % of Share of Total Income | 10.5 | 16 | 18.2 | 13.4 |
| Middle 50% | % of Share of Total Income | 33.9 | 48 | 50.1 | 40.4 |
| Top 10% | % of Share of Total Income | 55.7 | 36 | 31.7 | 46.2 |

Source: PPRC Governance and Economy Survey, 2015

Table 7 presents the distribution of income across different income groups in Bangladesh, categorised by urban and rural areas:

- **Bottom 40%:** This income group represents the 40% of the population with the lowest income. In Dhaka City, they account for 10.5% of the total income; in other urban areas, they account for 16%; and in rural areas, they account for 18.2%. Overall, they hold 13.4% of the total income in Bangladesh. It indicates that the bottom 40% of the population has a relatively small share of the total income, particularly in urban areas.
- **Middle 50%:** This income group represents the middle 50% of the population. In Dhaka City, they hold 33.9% of the total income; in other urban areas, they hold 48%, and in rural areas, they hold 50.1%. Combined, they account for 40.4% of the total income in Bangladesh. This group has a larger share of the total income than the bottom 40%, indicating a more equitable income distribution.
- **Top 10%:** This income group represents the top 10% of the population with the highest income. In Dhaka City, they hold 55.7% of the total income; in other urban areas, they hold 36%, and in rural areas, they hold 31.7%. Overall, they account for 46.2% of the total income in Bangladesh. This group has the largest share of the total income, indicating a significant concentration of wealth among a small portion of the population, particularly in urban areas.

Overall, the data suggests that income distribution in Bangladesh is skewed. A disproportionate amount of income is concentrated among the wealthiest segments of the population, particularly in urban areas. In contrast, most of the population, especially in rural areas, holds a smaller share of the total income.

Table 8: Income Inequality by Gini, Palma and Quintile Ratio in South Asian Countries.

| Country | Gini Coefficient (in terms of Consumption) | Palma Ratio (2010-17), Income Growth of the Bottom 40% vis-a-vis top 10%. | Quintile Ratio (2010-17) |
|-------------|--|---|--------------------------|
| Afghanistan | 0.31 (2016) | n/a | n/a |
| Bangladesh | 0.32 (2016) | 1.3 [-0.19(2010-16)] | 4.8 |
| Bhutan | 0.37 (2017) | 1.8 [-0.05(2012-17)] | 6.9 |
| India | 0.36 (2015) | 1.5 [-0.49(2004-11)] | 5.3 |
| Maldives | 0.31(2016) | 1.7 [n/a] | 7 |
| Nepal | 0.33 (2014) | 1.3 [3.58(2003-10)] | 5 |
| Pakistan | 0.32 (2018) | 1.2 [-1.53(2010-15)] | 4.4 |
| Sri Lanka | 0.39 (2016) | 1.9 [-0.48(2012-16)] | 6.8 |

Source: Human Development Reports (2009-2017), Poverty and Equity Data Portal, UNDP.

Table 8 shows the Income inequality in South Asian countries, as measured by various indices such as the Gini coefficient, Palma ratio, and quintile ratio, revealing significant disparities in wealth distribution across the region. In Afghanistan, Bangladesh, Maldives, and Pakistan, the Gini coefficients range from 0.31 to 0.32, indicating moderate levels of income inequality. At the same time, Bhutan, India, Nepal, and Sri Lanka exhibit slightly higher Gini coefficients ranging from 0.33 to 0.39. The Palma ratio, which compares the income growth of the bottom 40% with the top 10%, highlights a trend where the wealthiest segment experiences disproportionately higher income growth than the poorest. For instance, in Bangladesh, the bottom 40% earns only one-fifth of what the top 10% earns during the 2010-16 period, while in Nepal, the bottom 40% earns reciprocally 3.58 times more than the top 10%. It suggests that Nepal exhibits a relatively more comfortable level of inequality than other South Asian nations. Additionally, the quintile ratio, which measures the income of the top quintile to that held by the bottom quintile, demonstrates a considerable concentration of wealth among the wealthiest quintile in countries like Bhutan, Maldives, and Sri Lanka, where ratios exceed 6. In Bangladesh, the top 20% earns 4.8 times more than the bottom 20%, a trend mirrored in other South Asian countries. The Tax-GDP ratio and tax evasion fuel these inequalities. The wealthiest individuals, including government officials, business people, and politicians, often engage in tax avoidance practices such as evasion and money laundering, exacerbating income inequality. Conversely, the poorest segments of society, comprising farmers, rickshaw pullers, and retailers, bear the burden of taxes like VAT without

engaging in such offences. This stark contrast in tax burdens contributes to the widening income gap year after year.

4.0 Findings of the Study

Based on the findings presented in the provided tables and figures, we can draw several conclusions regarding the state of the Bangladesh economy, particularly concerning taxation, income inequality, and tax evasion:

- **Status of Bangladesh Economy:** Bangladesh faces challenges such as high tax evasion and extensive tax exemptions, leading to a significant tax gap and a low tax-GDP ratio. These contribute to widespread inequality and injustice within the country.
- **Deficit Budget and Tax-GDP Ratio Interaction:** Table 1 illustrates a significant per capita Gross National Income (GNI) increase over the years, accompanied by a slight rise in the tax-GDP ratio. However, there is a gradual escalation in the deficit alongside an increase in the growth rate. This growth rate is sustained through borrowing, resulting in significant debt-servicing costs and exacerbating budget deficits.
- **Contribution of Direct and Indirect Taxes:** Figure 1 shows that indirect taxes significantly outweigh direct taxes in Bangladesh. However, there is a positive trend with direct taxes increasing while indirect taxes decrease, potentially indicating a shift towards a more progressive tax structure that could help reduce income inequality.
- **Standard VAT Rates and Application of Reduced Rates:** Table 2 presents an overview of VAT rates across different countries, with Bangladesh having a 15% standard VAT rate. Reduced rates are applied to various essential items, indicating efforts to mitigate the burden on lower-income individuals.
- **Tax Gap and Tax-GDP Ratio Comparison:** Table 3 compares the tax gap and tax-GDP ratio among Asia-Pacific countries, highlighting Bangladesh's significant tax gap and low tax-GDP ratio. It indicates challenges in tax administration and revenue collection efficiency.
- **Tax Evasion Scenarios:** Table 4 shows fluctuations in tax detection and collection over the years, suggesting varying levels of effectiveness in tax enforcement and revenue collection.
- **Tax Evasion by TIN Holders:** Table 5 indicates a high rate of tax evasion among Bangladeshi Taxpayer Identification Number (TIN) holders, contributing to the decline in the tax-GDP ratio.

- **Tax Structure Pre and Post-VAT Regime:** Figure 2 illustrates changes in the tax structure before and after the introduction of VAT in Bangladesh, highlighting a reduction in sales tax and customs duty but also reflecting a regressive nature in VAT application.
- **Income Inequality by Gini, Palma, and Quintile Ratio:** Table 8 compares income inequality across South Asian countries, showing significant disparities in wealth distribution. Factors such as the Tax-GDP ratio, tax evasion, and regressive tax policies contribute to widening income gaps within these countries.

These findings underscore the importance of addressing tax evasion, reforming tax policies, and improving tax administration to reduce income inequality and promote economic development in Bangladesh.

5.0 Policy Recommendations

The study introduces recommendations for improving the Tax-GDP ratio, controlling or minimising the tax gap, lowering income inequality, and ensuring inclusive growth and overall better livelihood in Bangladesh.

1. **Enhance Governance and Tax Compliance:** Implementing good governance practices and strengthening tax compliance mechanisms are essential for maximising tax collection, reducing the size of the underground economy, and expanding the official economy. It can be achieved by lowering tax rates and broadening the tax base through effective enforcement.
2. **Remove Politically Biased Tax Exemptions:** To prevent tax evasion, eliminate irrational tax exemptions influenced by political interests and periodically reassess the validity of “infant industry arguments.” This will ensure a fair and transparent tax system that promotes economic growth without favouritism.
3. **Address the Informal Sector:** Address the free-rider problem by discouraging informal sector participation. With most of the labour force working in the informal sector and not contributing to income tax, including them in the tax net is crucial to promote fairness and equity among all citizens.
4. **Revise VAT Classification:** Revamp the VAT classification system to align with consumer classes. Introduce zero-rated VAT for goods and services consumed by low-income individuals and implement higher VAT rates for luxury items consumed by the affluent, ensuring social justice and equity in taxation.

5. **Establish a Comprehensive Database and Monitor Income:** Develop a comprehensive database of all individuals in Bangladesh and monitor their income and wealth status at the local level. Utilise this information to attract solvent individuals into the tax net and apply principles of ability to pay and progressive taxation to promote justice and equality.
6. **Combat Whitening of Black Money:** Cease practices that allow the whitening of black money, as it undermines the integrity of the tax system and discourages honest taxpayers. Ensuring that tax evaders face consequences proportionate to their actions will discourage tax evasion and promote fairness.
7. **Monitor Corruption and Money Laundering:** Strengthen monitoring mechanisms to prevent undue collusion among politicians, business people, and bureaucrats, which often leads to money laundering, under-reporting of income, mispricing, and illegal tax exemptions. Empower anti-corruption commissions and tax authorities to effectively combat such practices and uphold the tax system's integrity.

Relax Corporate Tax and Interest Rates: Businesses evade taxes when faced with higher corporate tax and interest rates. By relaxing these rates, the government can incentivise businesses to comply with tax regulations, thereby boosting total tax collection and contributing to an improved tax-GDP ratio.

6.0 Policy Implications of the Study

The policy implications stemming from the research findings emphasise the urgent need for comprehensive tax reforms, governance enhancement, and inclusive growth strategies in Bangladesh. Addressing the country's high tax gap and low tax-GDP ratio requires revising tax policies to ensure fairness, effectiveness, and transparency in revenue collection. Strengthening governance mechanisms, combating corruption, and improving compliance enforcement are essential to enhance tax administration and promote accountability. Moreover, fostering inclusive growth entails targeted interventions to address the needs of marginalised communities, integrate informal sector workers into the formal economy, and invest in education, healthcare, and social welfare programs. Reforming the VAT system to align with principles of social justice, preventing the whitening of black money, and combating illicit financial activities are critical measures to promote economic stability and equitable wealth distribution. Overall, the policy implications underscore the importance of proactive measures to address the identified challenges and pave the way for sustainable development and social progress in Bangladesh.

7.0 Conclusion

The study identifies several concerning trends in Bangladesh's economy over the years, despite a significant increase in per capita Gross National Income (GNI) from 2000-2001 to 2020-2021 fiscal years. Despite this economic growth, the Tax-GDP ratio has remained relatively low, hovering around 6%-9%, while the budget deficit has increased from 2.92% to 6% during this period. Bangladesh faces the highest tax gap and lowest tax-GDP ratio among Asia-Pacific countries, alongside a growing budget deficit. Alarming indicators such as the Gini coefficient, Palma ratio, and quintile ratios reflect worsening income inequality in Bangladesh. Tax exemption costs have also escalated, reaching 2.28% of GDP in the 2021 fiscal year. Despite allocating a substantial portion of expenditure to debt servicing (approximately 18%), income inequality, as measured by the Gini coefficient, remains high at 0.48. Various factors contribute to this situation, including money laundering through mispricing of goods and services, tax defaulting, corruption in tax collection, poor tax compliance, ineffective tax composition, and irrational tax exemptions. Indirect taxes, primarily Value Added Tax (VAT), constitute 70% of collected taxes, exacerbating income inequality as VAT is regressive and applies equally to all necessary goods regardless of income level. Studies by organisations like the Centre for Policy Dialogue (CPD) reveal alarming disparities, with the wealthiest 1% holding a disproportionate share of national income. The bottom 40% earns significantly less than the top 10%.

Additionally, the top 20% earns nearly five times more than the bottom 20%, widening the income gap. The government's reduction in expenditures on crucial sectors such as education, research and development, and healthcare, coupled with escalating debt servicing costs, exacerbates economic challenges. Ultimately, these issues stem from a high tax gap and low Tax-GDP ratio, perpetuating income inequality and hindering sustainable economic development in Bangladesh. Addressing these root causes is crucial for fostering a more equitable and prosperous economy. Achieving inclusive growth and development requires political stability, ethical conduct, patriotism, and a solid determination to overcome national and global challenges. It is imperative to renovate the rigid tax structure by identifying and addressing all its loopholes to enhance national tax revenue. Domestic resource mobilisation can play a pivotal role in reducing deficit financing and alleviating debt servicing costs, particularly with the impending transition of Bangladesh from a Least Developed Country (LDC) to a developing country by 2026. This transition will likely entail higher costs for foreign loans, withdrawal of the Generalized System of Preferences (GSP) from key foreign currency-earning sectors like the readymade garments industry, and implementation of property rights in the pharmaceutical industry. The credibility and self-sufficiency of the government

and the nation must be prioritised to realise the vision of a prestigious, self-reliant, and developed Bangladesh by 2041. Implementing a widely accepted and inclusive growth-oriented flexible tax policy, coupled with a well-trained, ethical, and technically proficient National Board of Revenue (NBR) team, can effectively narrow the tax gap, boost the tax-GDP ratio, and uphold principles of social justice and equality without necessitating an increase in tax rates in Bangladesh.

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Transformation of Rice Farming to Commercial Farming in Mymensingh: An Empirical Evidence Based on Farmer's Livelihood Patterns

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Abstract

The research aimed to compare the financial profitability of rice farming with diversified commercial farming, including crops, fisheries, livestock, and poultry, and examine the impact of transitioning rice farms to diversified ventures on farmers' livelihood patterns. Primary data were collected from 120 households in Mymensingh Sadar and Muktagacha Upazilas, with 40 respondents being rice farmers and 80 engaged in commercial farming. Both qualitative and quantitative methods were used, employing econometric models (focusing on the chi-square test) and descriptive statistics. The study disclosed net returns for fish, livestock, poultry, and rice farming, amounting to 29,25,157 Tk./ha, 3,90,055 Tk./farm, 2,83,193 Tk./farm, and 42,188 Tk./ha, respectively. The undiscounted benefit-cost ratios (BCR) for fish, livestock, and poultry farming were 1.78, 1.34, and 1.33, surpassing the BCR of rice farming, which was 1.25. The study also revealed enhancements in farmers'

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human, social, natural, physical, and financial capital from transforming rice farms into commercial enterprises.

Keywords: *Transformation · Profitability · Rice farming · Commercial farming · Livelihood · Bangladesh*

1. Introduction

Encompassing an expanse of 148,460 square kilometres, Bangladesh stands as a prominent agriculture-based developing nation on the global stage. Since attaining independence in 1971, agriculture has held its position as the cornerstone of the country's economy, contributing approximately 11.38 percent to the GDP (BBS, 2022). This sector plays a multifaceted role, serving as the primary source of employment, livelihood, and food security for most rural inhabitants and as a crucial supplier of raw materials to industries, contributing significantly to the nation's exports. Despite the prevailing trend towards industrialisation in the modern economy, agriculture remains the lifeblood of many agrarian economies, Bangladesh being a notable example (Bishwajit et al., 2014). Rural livelihoods have been predominantly shaped by agricultural activities for many years (T. Ahmed, 2015); a staggering 84 percent of the rural population in Bangladesh is directly or indirectly reliant on agriculture for their sustenance (Moyen Uddin, 2015). The significance of farming practices in Bangladesh extends beyond merely providing substantial employment opportunities. It plays a pivotal role in meeting the dietary requirements of the burgeoning population, emerging as a crucial factor in ensuring food security for the nation. In navigating the balance between modernisation and traditional practices, agriculture in Bangladesh remains a linchpin in addressing the evolving needs of its populace, both economically and nutritionally (M. Ahmed et al., 2021).

The transformation of land use emerges as a critical concern, particularly in tropical developing countries like Bangladesh (Ahammad et al., 2021a). Bangladesh's land use pattern is undergoing significant changes to meet the dynamic demands of society, exerting pressure on the natural environment and causing disharmony within the natural system (This shift is emblematic of agricultural modernisation, a transformative process transitioning from traditional practices, primarily rice farming, to a more diverse and commercially oriented approach involving fish, livestock, and poultry. This evolution integrates modern industry, advancements in science and technology, and sophisticated economic management methods, propelling agricultural productivity beyond traditional boundaries (Jannat et al., 2021). Over the years, Bangladesh has witnessed substantial land transformation fuelled by population and economic growth, infrastructure expansion (Islam & Hassan, 2011), and climate change (Rahman

& Manprasert, 2006). This metamorphosis is reflected in the transition from rice farming to commercial agriculture, driven by uncontrolled population increase and economic development. Small-scale farmers respond by making diverse land use decisions, shifting from crop fields to fisheries and converting rice farms into livestock and poultry farms in the short run to achieve food self-sufficiency. In this densely populated country, Bangladesh heavily relies on these evolving sectors to meet the escalating demand for food, protein, and livelihood opportunities (Ahmed & Waibel, 2019; Alamgir et al., 2023; Islam & Hoq, 2018). Globally, around 60% of land changes are directly associated with human activities, with the remaining attributed to indirect drivers like climate change from 1982 to 2016 (Song et al., 2018). Hence, proactive interventions, such as enhancing infrastructure access and mitigating the adverse effects of climate change, are imperative to ensure future yield growth. In Bangladesh, cropland use for commercial farming has expanded over time in response to market demand and a favourable profit growth rate. Simultaneously, rice production's unpredictability and low market prices have further propelled this transformation. Commercial practices in Bangladesh predominantly involve cultivating fish, livestock, and poultry. The conversion of rice farms into different commercial ventures, such as fish farms, poultry, and cattle farms, has reshaped the land use patterns of major cities. Bangladesh has emerged as a significant player in fish and animal production and export in South Asia, with vast water resources, including ponds, lakes, canals, rivers, estuaries, and coastal regions, fostering the growth of the aquaculture industry in recent decades (Gias, 2005; Shamsuzzaman et al., 2017). Livestock and aquaculture production are pivotal in sustaining the population's livelihoods. Consequently, these transformations have altered the physical landscape and led to significant changes in farmers' livelihood assets, encompassing human, social, financial, natural, and physical capital.

There is a scarcity of published literature that assesses changes in farmers' livelihood patterns resulting from transforming rice farms into commercial enterprises. Vongvisouk et al. (2014) explored the impact of shifting agriculture on rural livelihoods across six villages in northern and central Laos, noting an intensification of rice shifting cultivation with the introduction of cash crops. Ahammad et al. (2021b) studied land use changes and livelihood outcomes in rural Bangladesh, finding variations in household income among zones based on existing land uses. Hossain and Bayes (2009) provided insights into the rural economy of Bangladesh, covering agriculture, the non-farm sector, and the influence of agrarian structure on productivity, income distribution, and poverty.

Iiyama et al. (2008) examined livelihood activities in Kenya, identifying significant impacts of age, gender, education, proximity to training centres, and

credit on livelihood diversification. Rahman and Al-Amin (2016) investigated the transformation of rice fields into various ventures and highlighted the high production cost as a barrier to profitability. However, the comparative profitability of rice farming and commercial activities such as fish, cattle, and poultry farming remains underexplored in rural Bangladesh.

This research aims to fill the existing knowledge gaps by investigating how farmers' livelihoods evolve during the transition from high-yielding variety (HYV) rice farming to fish, livestock, and poultry farming. Additionally, the study seeks to compare the profitability of rice farms with different commercial ventures and identify significant constraints farmers face. The findings will contribute valuable insights to policymakers in formulating guidelines for rice and commercial farmers, ultimately enhancing overall livelihood conditions in Bangladesh.

2. Materials and Methods

2.1. Study Area

The research was conducted in the Mymensingh district, specifically in the Upazilas of Mymensingh Sadar and Muktagacha. These Upazilas were intentionally selected due to their significance as major commercial agricultural farming areas within the district, where notable transformations in land use have occurred over time. The motivation behind choosing these specific locations stems from the prevalent desire among farmers in the Mymensingh district to convert their traditional rice fields into fishponds and livestock farms, seeking to diversify their agricultural activities. The selection of Mymensingh Sadar and Muktagacha was strategic, driven by the observation that these Upazilas present a more dynamic and evolving scenario than other regions in Bangladesh. Researchers aimed to delve into these study sites, anticipating that the findings would yield valuable insights for future generations by capturing the nuances of changing agricultural landscapes. Moreover, the chosen locations were deemed ideal for scrutinising the shifts in livelihood patterns resulting from transforming rice fields into fish and livestock farming. The study sought to understand how such changes impact the local communities' economic activities and overall well-being. By focusing on these Upazilas, the research aimed to provide a nuanced understanding of the multifaceted implications of transitioning from traditional rice farming to more diversified agricultural practices, contributing essential knowledge for future agricultural planning and development.

2.2. Sample size

The primary focus of this study centred on individual farm households as the sampling unit. Three villages were carefully selected from each of the identified

Upazilas. In the selection process, commercial farms were chosen through a random sampling method, and similarly, rice farmers were randomly selected to ensure a representative and unbiased sample. The aim was to comprehensively understand both commercial and traditional rice farming contexts within each village. A total of 120 respondents were included in the study, 40 of whom were rice farmers and 80 commercial farmers.

2.3. Data collection and data management

The method employed for data collection was personal interviews, allowing for a detailed exploration of the dynamics within each household. In the context of this research, the household served as the primary unit of analysis, with a specific focus on the household head who assumed the role of the main informant. The decision to interview household heads was grounded in recognising that, in the Bangladeshi context, the household head plays a pivotal role as the primary decision-maker in farming and other family operations.

Qualitative and quantitative research methodologies were employed to collect primary data for this study. The primary sources of information were interviews with key informants and a questionnaire survey conducted among farm households. Initial data gathering involved engaging with respondents, followed by a comprehensive household survey. Participants were given a concise overview of the research objectives and data requirements.

To gather insightful information from the selected households, a deliberate and personalised approach was adopted, employing face-to-face interviews. This method involved using a meticulously designed questionnaire with closed-ended questions.

The finalised version of the refined questionnaire was subsequently deployed in the actual survey, aiming to comprehensively capture the diverse perspectives, thoughts, and challenges farmers face. The questionnaire's coverage spanned various essential topics, encompassing farmers' farm profiles, details regarding rice's high-yielding varieties (HYV), and specifics related to fish, livestock (cattle), and poultry farming. Furthermore, the questionnaire probed into the profound changes in farmers' livelihood patterns resulting from agricultural transformations, shedding light on their major challenges. By employing this extensive set of questions, the study aimed to capture a holistic view of the intricate dynamics shaping farmers' experiences in the context of agricultural transformation.

2.4. Data Analysis

After collecting data from the household survey was coded correctly, a master sheet was created in MS Excel. The data cleaning process was also done on the

MS Excel master sheet after entering all the data. Descriptive statistical methods like average, percentage, etc., were utilised to analyse the comparative profitability of rice, fish, livestock, and poultry farming. The MS-EXCEL software was used to exhibit the results of the descriptive analysis in tables. The Chi-square test was employed to assess the change in the livelihood pattern of respondent farmers through the transformation of agriculture.

2.4.1. Comparative Profitability Analysis of Rice and Diversified Commercial Farming

Collected data were presented in a tabular sheet. Analyses were done by classifying the tables according to the study's objectives. Simple correlations between dependent and independent variables were examined in tabular analysis. Farm business analytical procedures such as enterprise costing, gross margin and benefit-cost analysis were carried out to determine the firms' profitability. The following formulas are provided:

Gross Return (GR)

The average price during the harvesting season was multiplied by the entire volume of output produced by a firm to determine gross return.

The following equation was used to estimate the Gross Return:

Gross Return,

$$GR_i = \sum_{i=1}^n Q_i P_i$$

Where,

GR_i = Gross return from the i^{th} product (Tk./ha);

Q_i = Quantity of the i^{th} product (Tk./ha);

P_i = Average price of the i^{th} product (Tk./kg); and

Computation of total cost (TC)

Total cost (TC) includes all variable and fixed cost items involved in the production process. The total cost was estimated as follows:

$$TC = \sum P_{xi} \times X_i \times A + TFC$$

Where,

TC=Total cost (Tk./ha);

P_{xi} = Per unit price (Tk./kg);

X_i =Quantity of input (kg/ha);

A= Area under production measured in hectare; and

TFC=Total fixed cost

Gross Margin (GM)

Gross margin is the difference between revenue and expenses. It is typically determined by the difference between the gross return and the total variable costs.

The following equation was used to determine the gross margin:

$$GM = GR - TVC$$

Where,

GM = Gross margin;

GR = Gross return; and

TVC = Total variable cost

Net Return

In the net return analysis, fixed factors, including cost and land rent, interest on operating capital, etc., were considered. The profitability analysis was computed by subtracting the gross return from all costs (both variable and fixed). To determine the net return of production, the following equation was used:

$$\pi = \sum_{i=1}^n (P_y Y) - \sum_{i=1}^n P_{x_i} X_i - TFC$$

Where,

π = Net return (Tk./ha);

P_y = Per unit price of the product (Tk./ha);

Y = Quantity of the production per hectare (kg);

P_{x_i} = Per unit price of the i^{th} inputs (Tk.);

X_i = Quantity of the i^{th} input per hectare (kg);

TFC = Total fixed cost (Tk.) and

Benefit-Cost Ratio (Undiscounted)

A benefit-cost ratio (BCR) is an indicator used in the formal discipline of cost-benefit analysis, which attempts to summarise any research's overall value for money. The undiscounted benefit-cost ratio (BCR) is a relative measure used to compare benefits per unit of cost. BCR was estimated as a ratio of gross return and gross costs. The general rule of thumb is that the project is a good investment if the benefit is higher than the cost (BCR > 1). The formula for calculating BCR (undiscounted) is specified below.

Benefit-cost ratio,

$$BCR = \frac{\text{Gross benefit}}{\text{Gross cost}}$$

2.4.2. Change in livelihood patterns

A chi-square test was employed to assess the change in the livelihood pattern of the respondent farmers through transforming rice farming into commercial agriculture.

A statistical technique called the chi-square test is used to compare actual outcomes with predictions. Analysing cross-classified category data is a prevalent practice in evaluation and research. Among the widely employed statistical analyses for investigating the relationship or disparity between categorical variables, Karl Pearson's chi-square tests and its variants stand out as frequently utilised methods (Franke et al., 2012). This test aims to establish whether a discrepancy between observed and expected data is the result of chance or a correlation between the variables you are researching. In order to better comprehend and analyse the relationship between our two category variables, a chi-square test is a great option. The chi-square test assesses the relationship between livelihood capital and the farming system.

Chi-Square Formula

The Chi-Square is denoted by χ^2 . The chi-square formula is:

$$\chi^2 = \sum (O_i - E_i)^2 / E_i$$

Where,

O_i = observed value (actual value)

E_i = expected value

3. Results and Discussion

3.1. Comparative Profitability Estimation

The sustainability of a business is reflected in the profit generated within a specific timeframe. Profit, defined as the gap between the monetary value of produced goods and the associated production resource costs, is contingent upon the revenue earned and operational expenses incurred by the business venture. The interplay of revenue and operating costs determines the net gain or loss the enterprise can experience.

3.1.1 Comparative Cost and Returns of Rice Farming

Table 1 provides a comparative breakdown of the costs associated with rice farming. For rice land preparation, the cost per hectare was Tk. 10,041, constituting 6.17 percent of the total cost, while the seed cost per hectare was Tk. 3,232, representing 1.99 percent of the total cost. In rice production, the per hectare costs of Urea, TSP, MoP, DAP, and Compost were Tk. 4,185, Tk. 4,332, Tk. 2,481, Tk. 2,265, and Tk. 825, respectively. These fertiliser costs comprised 2.57, 2.66, 1.52, 1.39, and 0.51 percent of the total production cost. The aggregate cost of fertilisers was Tk. 14,087, accounting for 8.7 percent of the total cost.

The labour costs for rice production included Tk. 29,620 for hired labour and Tk. 1,890 for family labour per hectare, with a total labour cost of Tk. 31,510,

making up 19.4 percent of the total cost. Pesticides and irrigation costs per hectare were Tk. 1,885 and Tk. 15,124, constituting 1.16 percent and 9.26 percent of the total cost, respectively. The interest on operating capital for rice production per hectare was Tk. 4,336, representing 2.67 percent of the total cost. These costs are variable expenses incurred in the day-to-day rice production process.

Notably, most farmers in the study area owned their land for rice cultivation. However, for those who rented land seasonally, the cost of land rental was considered a part of the land-use cost. For producers, land utilisation costs were considered fixed expenses, and the land-use cost for one hectare of field area was Tk. 63,646, making up 39.13 percent of the total cost. The comprehensive total cost, calculated by summing up all costs associated with the production process, amounted to Tk.162,642 per hectare.

Table 1: Per hectare total cost of Rice production

| Items | Cost (Tk./Ha) | Percentage of total cost (%) |
|-------------------------------|---------------|------------------------------|
| Variable cost | | |
| Land preparation | 10041 | 6.17 |
| Seeds | 3232 | 1.99 |
| Fertiliser | | |
| Chemical fertiliser | | |
| Urea | 4185 | 2.57 |
| TSP | 4332 | 2.66 |
| MP | 2481 | 1.52 |
| DAP | 2265 | 1.39 |
| Organic fertilizer | | |
| Compost | 825 | 0.51 |
| Insecticides | 1885 | 1.16 |
| Labor cost | | |
| Family labor | 1890 | 1.16 |
| Hired labor | 29620 | 18.21 |
| Irrigation | 15124 | 9.29 |
| Transportation | 8778 | 5.39 |
| Interest on operation capital | 4336 | 2.67 |
| Others | 2982 | 1.83 |
| Total variable cost | 91974 | 56.55 |

| | | |
|------------------|---------------|--------------|
| Fixed cost | | |
| Land use cost | 63646 | 39.13 |
| Others | 7021 | 4.32 |
| Total fixed cost | 70667 | 43.44 |
| Total cost | 162642 | 100 |

Comparative return of rice production is shown in Table 2. The overall rice farms income per hectare was Tk. 204830 and gross margin for rice production was Tk. 112856. Net return was calculated by deducting total cost from the gross return. Thus, per hectare net return for producing Rice was Tk. 42188. Table 2 shows that Benefit cost ratio (undiscounted) of rice production was estimated 1.25 implying that Tk. 1.25 would be earned by investing every Tk. 1.00 in rice production.

Table 2: Per hectare total return of rice production

| Items | Return (Tk./Ha) |
|-----------------------------------|-----------------|
| Return from main product, rice | 186453 |
| Return from by-product | 18377 |
| Gross Return | 204830 |
| Gross Margin | 112856 |
| Net Return | 42188 |
| Benefit cost ratio (Undiscounted) | 1.25 |

3.1.2. Comparative Cost and Returns of diversified commercial farming

3.1.2.1. Comparative Cost and Returns of fish farming

As per Table 3, the total pre-stocking management cost per hectare amounted to Tk. 15,061, constituting a mere 0.40 percent of the overall cost. This cost includes poisoning, liming, and fertiliser costs. The per hectare stocking management cost, detailed in Table 6.8, stood at Tk. 393,753, making up 10.35 percent of the total cost. This category encompasses the cost of fingerlings and the expenses associated with fry transportation. The cost of fingerlings is contingent on their availability at the appropriate time.

Post-stocking management costs, outlined in Table 6.9, amounted to Tk. 2,801,778 per hectare, representing a significant 73.66 percent of the total fish production cost. This cost includes expenses related to feed, fertiliser, and netting. The use of supplementary or balanced feed emerges as a crucial factor for enhancing fish production, contributing to better growth and survival rates. The

data in Table 6.9 further indicates that the average fish feed cost per hectare was Tk. 2,650,535, accounting for approximately 69.68 percent of the total cost of fish production. Additionally, the per hectare average fertiliser and netting costs were Tk. 73,852 and Tk. 62,136, constituting 1.94 percent and 1.63 percent of the total production cost, respectively.

Examining labour costs per hectare for fish production, Table 3 reveals an average cost of labour Tk. 26,943, representing 0.7 percent of the total cost. The total variable cost of fish farming is Tk. 3,387,640 per hectare, while the total fixed cost is Tk. 416,123 per hectare, encompassing land use, machinery and tools, and pond preparation expenditures.

Table 3: Per hectare total cost of fish production

| Items | Cost (Tk./Ha) | Percentage of total cost (%) |
|--------------------------------------|---------------|------------------------------|
| Variable cost | | |
| Pre-stocking management cost: | | |
| Poisoning | 2597 | 0.07 |
| Liming | 3372 | 0.09 |
| Fertiliser | | |
| Organic fertiliser | | |
| Cow dung | 256 | 0.007 |
| Chemical fertiliser | | |
| Urea | 2544 | 0.07 |
| TSP | 3003 | 0.08 |
| MP | 1964 | 0.05 |
| DAP | 1325 | 0.03 |
| Total | 15061 | 0.40 |
| Stocking management cost | | |
| Catla | 24976 | 0.66 |
| Silver carp | 6592 | 0.17 |
| Grass carp | 5871 | 0.15 |
| Mrigal | 10374 | 0.27 |
| Rui | 28088 | 0.74 |
| Raj-Puti | 16124 | 0.42 |
| Pangus | 148644 | 3.91 |
| Tilapia | 28858 | 0.76 |

| Items | Cost (Tk./Ha) | Percentage of total cost (%) |
|-------------------------------|----------------|------------------------------|
| Others | 115055 | 3.02 |
| Fry transportation | 9171 | 10.11 |
| Total | 393753 | 0.24 |
| Post-stocking management cost | | |
| Fish feed | 2650535 | 69.68 |
| Fertiliser | 73852 | 1.94 |
| Netting cost | 153865 | 1.63 |
| others | 15255 | 0.4 |
| Total | 2893520 | 73.66 |
| Labor cost | 26943 | 0.7 |
| Interest on operating capital | 150105 | 3.64 |
| Total Variable Cost | 3387640 | 89.06 |
| Total fixed cost | | |
| Land use cost | 362220 | 9.5 |
| Machine and tools | 10653 | 0.28 |
| pond preparation | 42005 | 1.1 |
| Others | 12452 | 0.03 |
| Total fixed cost | 416123 | 10.94 |
| Total cost | 3803763 | 100 |

Table 4 shows the overall profit from fish farming, with a total return of Tk. Tk. 6728920 and a gross margin of Tk. 3341280. The per-hectare net return for producing fish was Tk. 2925157, and the undiscounted BCR of fish production was estimated at 1.78, implying that Tk. 1.78 would be earned by investing every Tk. 1.00 in fish production.

Table 4: Per hectare total return of fish production

| Items | Returns (Tk./Ha) |
|-------------|------------------|
| Catla | 522007 |
| Silver carp | 298631 |
| Grass carp | 225831 |
| Mrigal | 375028 |
| Pangus | 1080234 |
| Rui | 704937 |

| | |
|-----------------------------------|----------------|
| Raj-Puti | 301391 |
| Tilapia | 816398 |
| Others | 2404463 |
| Gross Return | 6728920 |
| Gross margin | 3341280 |
| Net Return | 2925157 |
| Benefit-cost ratio (Undiscounted) | 1.78 |

3.1.2.2 Comparative cost and return of cattle farming

The comparative cost of cattle farming under the study area is presented in Table 5, which revealed that per hectare, the total variable cost was Tk. 1151729 per farm, which comprises 99.25 percent of the total cost. On the other hand, total fixed cost is meagre compared to variable cost, which was Tk.8732 per farm (0.75 percent of total cost). Variable costs of cattle production include expenditure on feed, labour, and veterinary care, as well as interest in operating capital. Fixed costs include housing and equipment costs for the maintenance of cattle.

Table 5: Per farm total cost of cattle farming

| Items | Cost (Tk./Farm) | Percentage of total cost (%) |
|-------------------------------|-----------------|------------------------------|
| Variable Cost | | |
| Purchase value of Animal | 678238 | 58.45 |
| Family Labor | 1808 | 0.15 |
| Hired Labor | 6400 | 0.55 |
| Paddy Straw(auti) | 61707 | 5.32 |
| Green grass | 14717 | 1.27 |
| Bran | 271568 | 23.40 |
| Salt | 45048 | 3.88 |
| Vitamin | 2590 | 0.22 |
| veterinary charge | 3571 | 0.31 |
| Electricity bill | 7976 | 0.69 |
| Transportation | 2119 | 0.18 |
| Interest on operating capital | 54844 | 4.73 |
| Other | 1143 | 0.09 |
| Total Variable Cost | 1151729 | 99.25 |

| | | |
|---------------------|----------------|-------------|
| Fixed cost | | |
| Housing cost | 4570 | 0.39 |
| Equipment and tools | 2580 | 0.22 |
| Others | 1582 | 0.14 |
| Total Fixed Cost | 8732 | 0.75 |
| Total Cost | 1160461 | 100 |

Table 6 shows that total return from cattle farming was Tk. Tk. 1550516, and the net return for producing cattle was Tk. 390055 per farm. According to Table 6, the undiscounted BCR of livestock production was estimated at 1.34, implying that Tk. 1.34 would be earned by investing every Tk. 1.00 in fish production.

Table 6: Per farm total return of cattle farming

| Items | Return (Tk./farm) |
|--------------------------|-------------------|
| Sell value of cattle | 871667 |
| Milk production | 673474 |
| By product | 5375 |
| Gross return | 1550516 |
| Gross margin | 398787 |
| Net return | 390055 |
| Benefit-cost ratio (BCR) | 1.34 |

3.1.2.3 Comparative cost and returns of poultry farming

The total cost of poultry farming was determined by combining the total variable cost and the total fixed cost associated with poultry farming. The total variable cost encompasses expenses related to purchasing day-old chicks and feed and costs for labour, veterinary services, electricity, and interest on operating capital. Tables 7 and 8 provide detailed insights into the overall expenditure and net profit derived from poultry farming.

As outlined in Table 7, the total expenditure for poultry production amounted to Tk. 848,105 per farm. In contrast, the gross revenue from selling poultry products and by-products stood at Tk. 1,131,298 per farm, as depicted in Table 8. Consequently, the undiscounted Benefit-Cost Ratio (BCR) of poultry production was calculated at 1.33. This implies that for every Tk, 1.00 is invested in poultry production, which is an estimated Tk. 1.33 would be earned, emphasising the profitability and financial viability of poultry farming as a lucrative venture. The positive BCR suggests that poultry production is an economically sound investment, yielding returns that surpass the initial capital investment.

Table 7: Per farm average cost of poultry farming

| Items | Cost (Tk./farm) | Percentage of total cost (%) |
|-------------------------------|-----------------|------------------------------|
| Variable cost | | |
| Day-old-chicks | 175166 | 20.96 |
| Family labor | 610 | 0.07 |
| Hired labor | 7784 | 0.93 |
| Poultry feed | 581958 | 69.65 |
| Vitamin | 3455 | 0.41 |
| Veterinary charge | 6888 | 0.82 |
| Electricity bill | 2455 | 0.29 |
| Transportation | 2334 | 0.28 |
| Interest on operating capital | 39086 | 4.68 |
| Other | 1063 | 0.13 |
| Total variable cost | 820799 | 98.23 |
| Fixed Cost | | |
| Land use cost | 12500 | 1.47 |
| Housing cost | 7370 | 0.86 |
| Equipment and tools | 5584 | 0.66 |
| Other | 1852 | 0.22 |
| Total fixed cost | 27306 | 3.22 |
| Total cost | 848105 | 100 |

Table 8: Per farm total return of poultry farming

| Items | Return (TK./farm) |
|--|-------------------|
| Product | 1108532 |
| By product | 22765 |
| Gross Return | 1131298 |
| Gross Margin | 310499 |
| Net Return | 283193 |
| Benefit-cost ratio (Undiscounted) | 1.33 |

Table 9 provides a conclusive insight into the profitability of diversified commercial farming compared to exclusive rice farming in the study areas. The net

returns per hectare were estimated at Tk. 29,25,157 for fish, livestock, and poultry farming, and Tk. 42,188 for rice farming. On a per-farm basis, the estimated net returns were Tk. 3,90,055 for fish farming, Tk. 2,83,193 for livestock farming, and Tk. 42,188 for rice farming.

Examining the undiscounted benefit-cost ratios (BCR), fish, livestock, and poultry farming exhibited ratios of 1.78, 1.34, and 1.33, respectively, surpassing the BCR of rice farming (1.25). This indicates that the returns generated from fish, livestock, and poultry farming outweigh the costs more significantly than those generated by rice farming. The higher BCR in commercial farming demonstrates its enhanced profitability.

Given the superior profitability of commercial farming, farmers in the study areas have shown increased interest in fish, livestock, and poultry farming alongside subsistence rice farming. This heightened interest is evidenced by the transformation of rice land into fish, livestock, and poultry farms, primarily driven by the favourable financial aspects of commercial farming. The findings suggest a strategic shift in farming practices as farmers seek to maximise their economic returns by diversifying into more profitable ventures.

Table 9: Comparative Profitability of Rice Farming and diversified Commercial farming (Fish, Livestock, Poultry)

| Items | Rice Production (Tk./Ha) | Fish Farming (Tk./Ha) | Cattle Farming (Tk./farm) | Poultry Farming (Tk./farm) |
|--------------------------------------|-----------------------------|--------------------------|------------------------------|-------------------------------|
| Total fixed cost | 70667 | 416123 | 8732 | 27306 |
| Total variable cost | 91974 | 3387640 | 1151729 | 820799 |
| Total cost | 162642 | 3803763 | 1160461 | 848105 |
| Product | 186453 | 6728920 | 1545141 | 1108532 |
| By product | 18377 | 0 | 5375 | 22765 |
| Gross Return | 204830 | 6728920 | 1550516 | 1131298 |
| Gross Margin | 112856 | 3341280 | 398787 | 310499 |
| Net Return | 42188 | 2925157 | 390055 | 283193 |
| Benefit-cost ratio (Undiscounted) | 1.25 | 1.78 | 1.34 | 1.33 |

3.2 Change in livelihood patterns

The decision to shift land significantly enhanced farmers' livelihood assets, encompassing human, social, financial, natural, and physical capital (Islam et al., 2020). Changes in livelihood resources and strategies were notably influenced by

policy and institutional shifts, including alterations in forest and land management laws, agricultural policies, forest policies, national projects, and social culture. Consequently, villagers adopted diverse livelihood strategies based on their individual conditions, such as agricultural intensification, livelihood diversification, or migration (Lu et al., 2020).

In line with sustainable livelihoods theory, as outlined by (McLeod, 2001), the recognised assets include:

- i. Natural (Environmental) capital: Involves natural resources like land, wildlife, water, environmental resources, and biodiversity.
- ii. Physical capital: Encompasses basic infrastructure such as housing, along with the means and instruments of production, including water, energy, sanitation, transport, and communications.
- iii. Human capital: Encompasses health, education, skills, and the capacity for work.
- iv. Social capital: Encompasses social resources like group memberships, trustworthy relationships, access to broader institutions, and networks.
- v. Financial capital: Encompasses financial resources available, such as regular remittances or pensions, savings, and access to credit supplies.

3.2.1 Human Capital

Human capital encompasses various factors such as knowledge, skills, attitudes, education, mental and physical health, ability to work, and training, collectively empowering individuals to pursue their livelihood strategies (Šlaus & Jacobs, 2011). The association between adopting commercial farming and the resulting changes in human capital was assessed using the chi-square test, as detailed in Table 10. The statistical significance of the chi-square test ($p < 0.05$) indicates a robust relationship between human capital and the shift in farming systems.

Crucial components of human capital include health and sanitation, and the table reveals that 96.2% of the selected commercial farmers reported an improvement in their health and sanitation through the transition from rice farming to commercial farming. Education, another vital asset of human capital, was categorised into four levels: 1) primary level (1 to 4 years of education), 2) secondary level (6-10 class), 3) higher secondary level (10-12 years), and 4) Degree (Bachelor and Masters) (Karim, 2006). Among commercial farmers, 81.3% noted an enhancement in the education level of family members through the transformation from rice farming to diversified commercial farming.

Moreover, 57.5% of respondents indicated that they underwent training following the shift from rice farming, contributing to a substantial improvement

(about 95%) in their technological knowledge about commercial farming. Additionally, 86.3% of commercial farmers experienced an increase in their ability to access information through this transformative process. These findings underscore the profound impact of commercial farming on various dimensions of human capital, ranging from health and education to technological knowledge and information accessibility.

Table 10: Changes in human capital

| Components | Pearson Chi-Square | Asymptotic Significance (2-sided) | Improved | | Unchanged | |
|--------------------------|-----------------------|---|----------|------|-----------|------|
| | | | No. | (%) | No. | (%) |
| Health and sanitation | 107.442 | .000 | 77 | 96.2 | 3 | 3.8 |
| Education | 59.067 | .000 | 65 | 81.3 | 15 | 18.8 |
| Training | 33.856 | 0.000 | 46 | 57.5 | 34 | 42.5 |
| Efficiency/ Knowledge | 103.636 | 0.000 | 76 | 95.0 | 4 | 5.0 |
| Access to information | 76.954 | 0.000 | 69 | 86.3 | 11 | 13.8 |

3.2.2 Social Capital

Social resources are shaped by relationships and networks within nuclear and extended families and among various communities and groups (Coleman, 1988). Informal social relations lay the foundation for informal safety nets, serving as crucial support mechanisms that individuals rely on to navigate challenges and emergencies in their pursuit of livelihood strategies (Kleih et al., 2003). Maintaining positive relationships with neighbours becomes imperative for survival during difficult situations, and these connections often result in financial benefits (M. Ahmed et al., 2021).

The adoption of commercial farming exhibited a positive correlation with the social capital of farmers, as indicated by a significance level of $P < .05$ (Table 11). Most farmers reported improvements in their social involvement (90%) and political engagement (61.3%) following their engagement in commercial farming. Additionally, approximately 91.3% of respondents affirmed an enhancement in their self-managerial capacity through the transition from rice farming to commercial farming. Moreover, 95% noted an increase in their self-prestige as a direct result of adopting commercial farming practices. These findings underscore the transformative impact of commercial farming on economic aspects and the social well-being and self-perception of the farmers involved.

Table 11: Changes in social capital

| Components | Pearson Chi-Square | Asymptotic Significance (2-sided) | Increased | | Unchanged | |
|--------------------------|--------------------|-----------------------------------|-----------|-----------|-----------|----------|
| | | | No. | (%) | No. | (%) |
| Social capital | 90.00 | 0.000 | 72 | 90.0 | 8 | 10 |
| Political involvement | 41.408 | 0.000 | 49 | 61.3 | 31 | 38.8 |
| Self-managerial capacity | 93.191 | 0.000 | 73 | 91.3 | 7 | 8.8 |
| <u>Social prestige</u> | <u>103.636</u> | <u>0.000</u> | <u>76</u> | <u>95</u> | <u>4</u> | <u>5</u> |

3.2.3 Natural Capital

Natural capital refers to the quality and quantity of available natural resources, with a crucial emphasis on people's access to and control over these resources (Deswandi, 2017). This encompasses the inflows and services provided by natural resources, making them integral components of natural capital. The information regarding the sample farmers' cultivable land and pond area was considered in this context.

Table 12 reveals that only 26.3% of respondents experienced increased cultivable land through the transformation from rice farming to commercial farming. Conversely, about 71.3% of farmers observed an expansion in their pond area because of transitioning from rice farming to commercial farming. This notable increase in pond area can be attributed to the widespread adoption of fish farming among these farmers, surpassing other agricultural activities. The data underscores the impact of commercial farming transformations on natural capital, particularly in the expansion and utilisation of pond areas for fish farming.

Table 12: Changes in natural capital

| Components | Pearson Chi-Square | Asymptotic Significance (2-sided) | Increased | | Unchanged | |
|-----------------|--------------------|-----------------------------------|-----------|------|-----------|------|
| | | | No. | (%) | No. | (%) |
| Cultivable land | 51.150 | 0.000 | 21 | 26.3 | 59 | 73.8 |
| Pond area | 54.286 | 0.000 | 57 | 71.3 | 23 | 28.7 |

3.2.4 Physical Capital

Physical capital encompasses essential infrastructure like transportation, housing, water, energy, communication facilities, and production equipment, enabling individuals to pursue their livelihoods (Rakodi, 2014). This category includes household furnishings, equipment, and various forms of physical infrastructure.

Table 13 underscores a noteworthy and positive relationship between the adoption of farming systems and the physical capital of the respondents. Among commercial farmers, approximately 82.5% reported improvements in their housing conditions, emphasising the tangible impact of adopting new farming practices on their living spaces. Furthermore, about 92.5% of farmers experienced an enhancement in the furniture within their homes, indicating a positive correlation between commercial farming and improvements in household assets. Additionally, around 65% of these farmers invested in computers and arranged cable networks, underscoring a proactive approach towards providing educational resources for their children. This highlights the broader positive impact that the adoption of commercial farming systems can have on the physical capital of households, contributing to improvements in living conditions and educational opportunities for the family.

Table 13: Changes in physical capital

| Components | Pearson Chi-Square | Asymptotic Significance (2-sided) | Increased | | Unchanged | |
|------------------|--------------------|-----------------------------------|-----------|------|-----------|------|
| | | | No. | (%) | No. | (%) |
| Housing | 69.209 | 0.000 | 66 | 82.5 | 14 | 17.5 |
| Furniture | 57.857 | 0.000 | 74 | 92.5 | 6 | 7.5 |
| Cable network | 44.348 | 0.000 | 51 | 63.7 | 29 | 36.3 |
| Computer/ laptop | 41.408 | 0.000 | 49 | 61.3 | 31 | 38.8 |
| Freeze | 82.656 | 0.000 | 91 | 88.8 | 9 | 11.2 |

3.2.5 Financial Capital

Individuals' financial resources, such as income, savings, credits, and remittances, constitute their financial capital, offering diverse livelihood options (Rakodi, 2014). This capital serves as a pivotal asset, facilitating the acquisition of other forms of capital, including natural capital (e.g., land), physical capital (e.g., fishing equipment), or human capital (e.g., education or training). Additionally, increased financial capital can enhance one's social capital, as a higher socioeconomic status often aligns with a stronger financial position (M. Ahmed et al., 2021).

As depicted in Table 14, adopting commercial farming practices, such as fish, livestock, and poultry farming, increased farmers' financial capital. Approximately 75% and 97.5% of respondents affirmed that they could retain more cash and increase their savings after transitioning from rice farming to commercial farming. This shift was attributed to the increased profitability of commercial farming compared to traditional rice farming.

Table 14: Changes in financial capital

| Components | Pearson Chi-Square | Asymptotic Significance (2sided) | Increased | | Unchanged | |
|--------------|--------------------|----------------------------------|-----------|-------|-----------|-------|
| | | | No | (%) | No | (%) |
| Cash in hand | 60.000 | 0.000 | 40 | 75% | 20 | 25% |
| Savings | 111.429 | 0.000 | 78 | 97.5% | 2 | 2.5% |
| Jewellery | 36.000 | 0.000 | 45 | 56.3% | 35 | 43.8% |

The study indicates that various livelihood assets increased for commercial farmers when they transitioned from rice farming to commercial agriculture. With diversified commercial farming proving more profitable than sole reliance on rice cultivation, commercial farmers found an opportunity to enhance their livelihood patterns. By converting their cropland into fish, livestock, and poultry farming, these farmers strategically improved their financial prospects, contributing to an overall improvement in their livelihoods.

3.3 Problems faced by the respondent farmers of the study area

In Bangladesh, there is a constant need to boost the production of crops, fish, livestock, and poultry to meet the growing demand for food. However, these agricultural practices pose risks to the environment and present numerous challenges for farmers. These challenges include shortages of quality fertiliser, seeds, feed, and hired labour, financial constraints, a scarcity of good fingerlings and day-old chicks, and other financial issues. This article addresses the broad spectrum of problems and difficulties associated with farming in the examined regions. Furthermore, this chapter proposes potential solutions to mitigate and manage the challenges linked to rice farming and commercial farming.

3.3.1 Constraints faced by commercial farmers

Every agricultural venture encounters challenges, and fish, livestock, and poultry farming are no exceptions. A survey of sampled households identified the prevalent issues in commercial farming, which are presented in Table 15. The survey revealed that the escalating price of feed, driven by the current state of the global market, is a significant concern for farmers engaged in fish, cattle, and poultry farming. Most respondents (65%) perceive the high feed price as a major challenge in their farming businesses.

The importance of high-quality feed for successful commercial farming is acknowledged, as excessive use of low-quality feed leads to poor appetite, sluggish growth, high feed conversion ratios, and low survival rates. Approximately 66%

of respondents recognised the problem of using low-quality feed in farming. Other challenges highlighted in the survey include the high cost of fingerlings, encountered by 75% of commercial farmers, and the high price of day-old chicks, reported by 85% of respondents engaged in commercial farming. Additionally, 64% of respondents faced challenges at the outset of their farming journey due to a lack of capital, emphasising the critical role of sufficient capital for starting and investing in a new agricultural business. Water management problems in fish farming areas, resulting from the use of pesticides and fertilisers, were reported by 39% of respondents. On the other hand, 61% of respondents did not encounter such issues during their fish farming endeavours.

Table 15: Problems faced by commercial farmers

| Problems | Yes (%) | No (%) |
|----------------------------------|---------|--------|
| High Feed Price | 65 | 35 |
| Quality of Feed | 66 | 34 |
| Lack of good quality fingerlings | 35 | 65 |
| The high price of fingerlings | 75 | 25 |
| The high price of day-old chicks | 85 | 15 |
| Lack of Capital | 64 | 36 |
| Illness determination issue | 45 | 55 |
| Difficulty with water management | 39 | 61 |

3.3.2 Problems Faced by the Rice Farmers

Table 16 outlines rice producers' prevalent challenges, with high input costs, insufficient capital, labour shortages, low rice prices, pest and disease issues, and a lack of quality seeds identified as the most frequent issues. The rising costs of necessary inputs, driven by global market competition, pose a significant burden on farmers who now have to acquire these inputs at a higher expense.

A substantial majority (75%) of respondents express concerns about the escalating input costs, considering it one of the primary challenges in rice cultivation. Additionally, around 50% of rice farmers faced initial challenges in crop farming due to a lack of capital, emphasising the need for sufficient financial resources to initiate business or procure necessary inputs.

The shortage of hired labour prolongs production time in crop farming, although roughly 60% of rice growers did not encounter significant difficulties in hiring workers for their fields. The remaining 40% reported occasional challenges in securing labour, causing delays in rice production.

Effective pest and disease management is crucial for sustainable production,

and approximately 55% of respondents claimed they could identify and address these issues before implementing measures. However, 45.8% of rice farmers expressed concerns about the unavailability of quality seeds, emphasising the importance of good-quality seeds for successful crop cultivation.

Table 16: Problems faced by the rice farmers

| Problems | Yes (%) | No (%) |
|-----------------------------|---------|--------|
| High input cost | 75 | 25 |
| Lack of capital | 50 | 50 |
| A labour shortage | 40 | 60 |
| Unfair price of rice | 71.8 | 28.2 |
| Pest and disease management | 55 | 45 |
| Lack of quality seeds | 45.8 | 54.2 |

The elevated education level of commercial farmers contributes to their superior access to extension services and information compared to rice farmers. This heightened accessibility may explain their ability to resolve challenges more efficiently. Conversely, limited education and restricted access to information and extension services hinder rice farmers from effectively addressing issues and achieving the desired output levels.

4. Conclusion

The research aimed to evaluate the financial profitability of rice farming compared to diversified commercial farming, which includes crops (rice), fisheries, livestock (cattle), and poultry as part of a commercial venture. The implications of these farming practices on farmers' livelihood patterns were also examined. The study found that diversified commercial farming proved more profitable than sole reliance on rice farming in the studied areas, demonstrating the economic viability of transitioning to commercial agriculture.

The research highlighted that transforming rice farms into commercial ventures led to increased livelihood assets for farmers. Converting rice land into diversified farms, incorporating fishery, livestock, and poultry empowered commercial farmers to enhance their livelihood patterns. Notably, the study revealed that commercial farmers tended to have higher education levels than rice farmers. This educational advantage facilitated better access to extension services and information and a more profound understanding of overcoming constraints.

Based on the findings, the study recommends providing educational support, especially for the children of farmers, to elevate literacy levels. Additionally, there

is a suggestion for training programs aimed at adopting new technologies and improving farm management practices to enhance farmers' income levels. The relevant authorities, such as the Ministry of Fisheries and Livestock, are encouraged to organise workshops, seminars, conferences, and live demonstrations to impart knowledge on the latest production and marketing techniques to grassroots-level commercial farmers and entrepreneurs. Furthermore, the availability of financial support, such as collateral-free credit from formal and semi-formal institutions, is recommended to facilitate the financial well-being of commercial farmers.

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Whether Relaxation in Law is the Main Reason for Increasing Non-Performing Loans of Commercial Banks of Bangladesh

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Abstract

The banking sector of Bangladesh is facing multiple problems now, of which the Non-Performing Loan (NPL) problem is the most discussed one. The government of Bangladesh, as well as Bangladesh Bank, has been undertaking steps towards reducing Non-Performing Loans. However, no step has proven effective in solving the issue. As of September 2022, the NPL ratio stood at 9.4%, which appears to be double that of the international standard. In this regard, a lot of research has been undertaken. It is pertinent to mention that our finance minister stated in Parliament in June '22 on non-performing loans. He determined the main reasons for Non-performing loans as a) Irregular practice in the local and international arena, b) the Bank's failure to select an appropriate borrower, c) Inadequate security against loans, keeping the same security in more than one bank and showing value of security more than actual market value, d) irregular documentation and lack of verification of genuineness of security document, e) diversion of loan-fund, allowing loan facility without assessing actual need and capacity, enhancement of credit limit frequently, allowing rescheduling and restructuring facility etc. Notably, no loophole in the legal system was absent for those reasons for non-performing loans. That is why the study of this topic is being demanded of time. This study attempts to identify whether relaxation in law is the main reason for the increase in the number of non-performing loans of commercial banks in Bangladesh. Both qualitative and quantitative approaches were used to attain the purpose of this study. This study revealed a significant result in recovering NPL through a court of law by passing complex rules by learned

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judges against loan defaulters. The study's outcome must be noted for future policy-making and NPL management in Bangladesh.

Keywords: *Non-performing Loans (NPL) · credit limit · Artha Rin Adalat · rescheduled*

Introduction

A loan that is in default or close to default is called a Non-performing loan (NPL). A higher NPL shows the bank's inability to recover its loans from clients. It is an acute problem for the banks of Bangladesh nowadays. The NPL ratio of the Banking sector was 6.1 percent in 2011, and after a sharp increase (10 %) in 2012, it reduced to 8.9 percent at the end of 2013. Later in 2014, the NPL ratio again increased to 9.7 percent but declined to 8.8 percent in 2015. Though there has been an upward trend in the NPL ratio in recent years, a downward movement of the NPL ratio has been found since 2019. At the end of June 2021, it stood at 8.2 per cent, and as of September 2022, the NPL ratio stood at 9.4 percent which appeared to be double that of international standards. The government of Bangladesh, as well as Bangladesh Bank, has been undertaking steps towards reducing Non-Performing Loans (NPL). However, no step has proven effective in solving the issue. The finance minister of Bangladesh, Mr AHM Mustafa Kamal, said in the Parliament in June '22 that the main reasons for Non-performing loans are: a) Irregular practice in the local and international arena, b) Bank's failure in selection of appropriate borrowers, c) Inadequate security against loans, Keeping same security in more than one bank and showing value of security more than actual market value, d) irregular documentation and lack of verification of genuineness of security document, e) diversion of loan-fund, allowing loan facility without assessing actual need and capacity, enhancement of credit limit frequently, allowing rescheduling and restructuring facility etc. Notably, any loophole in the legal system was absent for those reasons of non-performing loans. This study attempts to identify whether relaxation in law is the main reason for the increase in the number of non-performing loans of commercial banks in Bangladesh. This report will discuss non-performing loans along with the reasons for them and will try to find out whether relaxation in law is the main reason for the increase in the number of non-performing loans of commercial banks in Bangladesh. This paper will also recommend some policies related to the legal system to be adopted to eliminate the so-called "default culture" of Bangladesh.

Research Questions

What is the present situation of non-performing loans in Bangladesh?

What are the main reasons for commercial banks' non-performing loans in Bangladesh?

Is relaxation in law the main reason for the increase in non-performing loans of commercial banks in Bangladesh?

What are the policy recommendations for updating the country's law to eradicate the NPL problem in Bangladeshi commercial banks?

Objective of the study

The financial sector is suffering due to the alarming position of commercial banks in Bangladesh that are not performing loans. Different research papers and investigations have already discussed the many reasons behind this. However, many cases were pending before the country's Artha Rin Adalat (Money Loan Court) without significant results. This study tried to find an answer to the question of whether relaxation in law is the main reason for increasing non-performing loans of commercial banks in Bangladesh. Finding out the weakness in the country's laws may be helpful for policymakers in taking necessary measures to reduce NPLs in the country.

Methodology

This report is mainly prepared using secondary sources of evidence and some primary sources of information. The study is qualitative in nature. It uses different financial statistics, theoretical research, personal observations through media and online financial news, and financial reports from recognised financial institutes and newspapers. I have collected information and necessary data from primary and secondary sources.

Primary Sources: As mentioned earlier, the primary source of data used in our report is our personal observation from interviews with different experienced Bankers and keypersons of different institutions.

Secondary sources: The report is mainly based on secondary information and data from different sources. I got help from other academic books, websites, journals, newspapers, and published sources from the Bangladesh Bank and various departments of the Bangladesh government.

Background of the Study

The study has been undertaken to determine the actual scenario of non-performing loans in Bangladesh. Another reason is determining whether relaxation in law is the main reason for the increase in the number of non-performing loans of commercial banks in Bangladesh. The study was conducted to present it at the biennial conference 2023 of the Bangladesh Economic Association-Chattoogram Chapter. The Non-Performing Loans situation in Bangladesh's economy has risen to an alarming level, which is a significant threat to the smooth growth of the economy. For the sake of

the economy, there is no way to check the rise in NPL, which is now at about 10%. In developed nations, only 2% of a bank's loans are allowed to be non-performing loans. So, a necessary policy is required to be adopted to reduce the NPL of the country as per the policy recommendation of research in this regard.

Non-Performing Loans (NPL)

IMF defines "a loan as non-performing when payments of interest and principal are past due by 90 days or more, or at least 90 days of interest payments have been capitalised, refinanced or delayed by." A loan becomes non-performing in Bangladesh when classified as sub-standard (as per Bangladesh Bank directives). Non-performing loans ("NPLs") refer to those financial assets from which banks no longer receive interest and/or instalment payments as scheduled. They are known as non-performing because the loan ceases to "perform" or generate income for the bank. In a financial system, NPLs can further thwart economic recovery by shrinking operating margins and eroding the capital base of the banks to advance new loans. In addition, NPLs, if created by the borrowers willingly and left unresolved, might act as a contagious financial malaise by driving good borrowers out of the financial market. A bank with a high level of NPLs is forced to incur carrying costs on non-income-yielding assets that strike at profitability and the capital adequacy of a bank. Consequently, the bank faces difficulties in augmenting capital resources.

In other words, NPLs (Non-performing loans) include loans that show signs of weakness in the credit quality. When the quality of a loan deteriorates, the first signal comes as irregularity in the client's loan repayment. Often, a loan account starts having past dues. International best practices require that a loan be classified as non-performing if its principal and/or interest are three months or more in arrears. Banks in Bangladesh are allowed to classify non-performing loans based on a time frame of six months.

Effects of NPL

NPL has a double effect on financial institutions. There is no income from NPL, and the capacity of further loans is reduced due to the provisioning rule against NPL. NPLs negatively impact the income statement because of provisioning for loan losses. In extreme cases, a high level of NPLs in the banking system causes systemic risk, inviting a panic run on deposits and sharply limiting financial intermediation investment and growth. The main effects of NPL on the economy are summarised below: a) Loss of current revenue, b) High loan loss provision, c) Erosion of bank's capital, d) Financial crisis, e) High-risk premium, f) High loan price, g) Low rate of investment, h) Low economic growth.

Non-Performing Loan Ratio in Different Countries

Table 01 shows that the NPL ratio (available) of most of the world's countries is between 0.1% and 5%. Only nine countries' NPL ratios are within the range of 5.1 to 10%, and Bangladesh's ratio is at the bottom of that range, which is in the group of 9.1 to 10%.

Table 1: Comparison of Non-Performing Loans Ratio by Country during 2021-2022.

| Country Name | NPL Ratio |
|---|-------------|
| Albania, Argentina, Armenia, Australia, Austria, Belgium, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Bulgaria, Canada, Chile, China, Colombia, Croatia, Czech Republic, Denmark, Ecuador, Egypt, Estonia, Finland, Georgia, Hong Kong, Hungary, Indonesia, Ireland, Israel, Italy, Japan, Kazakhstan, South Korea, Kosovo, Kuwait, Laos, Latvia, Lithuania, Macau, North Macedonia, Malaysia, Mexico, Netherlands, Norway, Oman, Palestine, Panama, Paraguay, Peru, Philippines, Portugal, Romania, Saudi Arabia, Serbia, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan | 0.1% to 5% |
| Mauritius, Montenegro, Poland | 5.1% to 6% |
| Moldova | 6.1% to 7% |
| India, Iran, Pakistan | 7.1% to 8% |
| Morocco | 8.1% to 9% |
| Bangladesh | 9.1% to 10% |
| Cyprus, Ghana, Kenya, Kyrgyzstan, Mongolia | Above 10% |

Table 02 shows that the NPL ratio of the Banking sector was 6.1 per cent in 2011, and after a sharp increase (10 per cent) in 2012, it reduced to 8.9 per cent at the end of 2013. Later in 2014, the NPL ratio again increased to 9.7 percent but declined to 8.8 percent in 2015. Though there has been an upward trend in the NPL ratio in recent years, a downward movement of the NPL ratio has been found since 2019. At the end of June 2021, it stood at 8.2 percent. It reveals from other sources that as of September 2022, the NPL ratio of Bangladesh stood at 9.4%.

Table 2: Ratio of Gross NPLs to Total Loans by Types of Bank

| Bank Types | (In Percent) | | | | | | | | | | |
|------------|--------------|------|------|------|------|------|-------|------|------|------|---------------------|
| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 End June |
| SCBs | 11.03 | 23.9 | 19.8 | 22.2 | 21.5 | 25.0 | 26.50 | 30.0 | 23.9 | 20.9 | 20.6 |
| SBs | 24.6 | 26.8 | 26.8 | 32.8 | 23.2 | 26.0 | 23.4 | 19.5 | 15.1 | 13.3 | 11.4 |
| PCBs | 2.9 | 4.6 | 4.5 | 4.9 | 4.9 | 4.6 | 4.9 | 5.5 | 5.8 | 4.7 | 5.4 |
| FCBs | 3.0 | 3.5 | 5.5 | 7.3 | 7.8 | 9.6 | 7.0 | 6.5 | 5.7 | 3.5 | 3.9 |
| Total | 6.1 | 10.0 | 8.9 | 9.7 | 8.8 | 9.2 | 9.3 | 10.3 | 9.3 | 7.7 | 8.2 |

Source: Bangladesh Bank Annual Report 2020-2021

As of June 2021, the NPLs of the SCBs, SBs, PCBs, and FCBs were BDT 438.36 billion, BDT 36.85 billion, BDT 491.91 billion, and BDT 24.93 billion, respectively; for the whole banking sector, it was BDT 992.05 billion.

Table 3: Amount of NPLs by Types of Banks.

| Bank Types | (in billion BDT) | | | | | | | | | | |
|------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------------|
| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 End June |
| SCBs | 91.7 | 215.2 | 166.1 | 227.6 | 272.8 | 310.3 | 373.3 | 487.0 | 439.9 | 422.7 | 438.4 |
| SBs | 56.5 | 73.3 | 83.6 | 72.6 | 49.7 | 56.8 | 54.3 | 47.9 | 40.6 | 40.6 | 36.9 |
| PCBs | 72.0 | 130.4 | 143.1 | 184.3 | 253.3 | 230.6 | 294.0 | 381.4 | 441.7 | 403.6 | 491.9 |
| FCBs | 6.3 | 8.5 | 13.0 | 17.1 | 18.2 | 24.1 | 21.5 | 22.9 | 21.0 | 20.4 | 24.9 |
| Total | 226.5 | 427.4 | 405.8 | 501.6 | 594.0 | 621.8 | 743.1 | 939.2 | 943.2 | 487.3 | 992.1 |

Source: Bangladesh Bank Annual Report 2020-2021

Non-performing Loan: Theoretical Aspects

The term “Overdue” is defined in the Circulars of Bangladesh Bank as follows: (i) Any Continuous Loan, if not repaid/renewed within the fixed expiry date for repayment, will be treated as past due/overdue from the following day of the expiry date. (ii) Any Demand Loan, if not repaid/rescheduled within the fixed expiry date

for repayment, will be treated as past due/overdue from the following day of the expiry date. (iii) In case any instalment(s) or part of instalment(s) of a Fixed Term Loan (not over five years) is not repaid within the fixed expiry date, the amount of unpaid instalment(s) will be treated as past due or overdue from the following day of the expiry date. (iv) In case any instalment(s) or part of instalment(s) of a Fixed Term Loan (over five years) is not repaid within the fixed expiry date, the amount of unpaid instalment(s) will be treated as past due/overdue after six months of the expiry date. (v) The Short-term Agricultural and Micro-Credit, if not repaid within the fixed expiry date for repayment, will be considered past due/overdue after six months of the expiry date.

Loans may be termed non-performing, both from the objective and subjective judgment. Bangladesh Bank grossly sets objective criteria for loan classification. The Instruction Circulars guide subjective decisions by the bank officials from the top management. Bangladesh Bank prescribed the following objective criteria for loan classification vide BRPD Circular No. 03, dated 21 April 2019:

A Continuous Loan, Demand Loan, Fixed Term Loan or any instalment(s)/ part of instalment(s) of a Fixed Term Loan which will remain past due/overdue for three months or beyond but less than nine months, the entire loan will be put into the “Sub-standard (SS)”.

A Continuous Loan, Demand Loan, Fixed Term Loan, or any instalment(s)/ part of instalment(s) of a Fixed Term Loan that remains past due /overdue for a period of 9 months or beyond but less than 12 months will have the entire loan put into the “Doubtful (DF)”.

A Continuous Loan, Demand Loan, Fixed Term Loan, or any instalment(s)/ part of instalment(s) of a Fixed Term Loan that remains past due/overdue for a period of 12 months or beyond will have the entire loan put into the “Bad/Loss (B/L).”

Causes of Non-Performing Loans

In this section, we will discuss the causes of Non-Performing loans, which the senior bankers and researchers have acknowledged who have been interviewed.

Clients Related Causes

1. **Diversion of Funds:** One of the main reasons for NPLs is the diversion of funds. Loan funds are diverted for dealing purposes, family businesses, repaying loans taken from various causes, house construction, etc.
2. **Willful Defaulter:** Some willful defaulters are habitual defaulters. They acquire loans from banks with the bad intention of not paying back the loans.

3. **Low cash flow:** Low cash flow due to low market share may cause loan default. Low market share means low sales and low sales mean low income, which results in default.
4. **Unrealistic Installment Size:** In many cases, the borrower cannot comply with the conditions of credit terms as the instalment size is too big or the repayment period is too small for them to execute.
5. **Failure to Collect Sale Proceeds:** The borrower faces a loss in business due to sales on credit. As soon as they fail to recover the money from the debtors in due time, they fail to run production and fail to pay.
6. **Lack of Financial Knowledge:** Many customers default due to a lack of financial knowledge. They do not know the good and bad sides of banking procedures, at least not enough to run the accounting contacts.
7. **Lack of Experience:** Lack of experience is one cause of loan repayment failure.

Bank Related Causes

1. **Failure to timely disbursement:** For some businesses, investing the money at the right time is very important. But sometimes banks fail to provide loans at the right time because of their limitations. Borrowers face the problem with the invested money they partially injected into the business. The non-availability of loan funds may negatively impact the return of the client and may cause a loss, which may lead to non-performing loans.
2. **Higher Rate of Interest:** A higher interest rate is always a big problem. Moreover, sometimes banks change the interest rate without obtaining consent from the client as the sanction letter permits them to change the interest rate from time to time.
3. **Barrier in Extension of Loan Period:** If clients face difficulties in their business and fail to repay loans because of a loss in business in a specific time, Banks reject to allow extra time for the current loan. So defaulters cannot get out of trouble and cannot continue their business. Therefore, they can never repay all the money they borrow from banks.
4. **Lack of Ensuring End Use of Money.** Loans are provided for a certain purpose, which the banker should monitor to ensure proper fund usage. However, a lack of monitoring of loan usage can lead to default.
5. **Right action at the right time:** When corrective actions are taken at the right time, the chance of a loan default lessens. If a customer misses an instalment, the bank's related officer must take action to learn about the

customer and understand the problem. If the right action is taken, the chance of loan default is reduced.

6. Unskilled Banker: If the loan proposal is assessed by an unskilled banker, the loan will obviously be in default.
7. Unscrupulous banker: Some unscrupulous bankers are accountable for creating default loans in the banking sector to some extent by disbursing loans to little-known or fake companies, which the companies do not deserve.
8. Directed Loan: If the loan is allowed under the direction of higher authority or political pressure, it is disbursed without appropriate or satisfactory credit calculation or compliance with credit norms. This loan will ultimately become a default.

Economic and Political Reasons

1. Political uncertainty: Political uncertainty hinders the smooth production and supply of products, and political chaos is reflected as one of the other reasons for loan default in our country.
2. Miscreants: It is found that miscreants' activity affects the profitability of the businesses. It forces donations and sometimes lowers the profitability of the company.
3. Lack of Power Supply, Utility, etc.: Lack of uninterrupted power supply and lack of infrastructure facilities might be one of the most important causes of loan default.
4. Sudden Change of Government Policy: Government policy is reflected as a reason for the loan default since it affects the local sales and distribution of the companies' products.

Other Reasons

Other reasons for loans are imperfect offering practice, lack of enquiry into business risks, lack of proper appraisal of security or mortgage assets, undue influence by debtors, external pressure, loans from Government associations, Government policy for disbursement of loans, and lack of legal act.

Different types of Legal Actions

Though there are two specific laws, the Artha Rin Adalat Act 2003 and the Bankruptcy Act 1997, for financial institutions of Bangladesh, there are some other laws under which lending bankers can file suit in associated courts. All the legal measures are as follows:

- (a) Filing certificate cases under the Public Demand Recovery Act 1913.
- (b) Loans can be recovered by selling the mortgaged property or taking over management of the defaulting concern.
- (c) Filing criminal cases for breach of trust under 406/420 BPC.
- (d) Filing criminal cases under section 138 of N. I Act 1994.
- (e) Filing money suitcases under the Artha Rin Adalat Act 2003.
- (f) Filing Bankruptcy cases under the Bankruptcy Act 1997.

Now, we would like to briefly highlight the above legal recourses: Filing certificate cases under the Public Demand Recovery Act. 1913

However, these courts will try all cases about loan recovery for loans up to Tk. 50,000 given by Bangladesh Krishi Bank (B.K.B), Rajshahi Krishi Unnayan Bank (R.A.K.U.B), and other government-owned financial institutions, certificate cases may also be filed under the Public Demands Recovery Act-1913 (act no. III of 1913) instead of filing cases in Money loan courts.

Filing criminal cases for breach of trust under 406/420 BPC

Financial Institutions may file cases against the borrower before the Criminal Court as per Sections 406 and 420 of the Penal Code 1860. The sections are as follows:

Section 406: Punishment for criminal breach of trust.: Whoever commits a criminal breach of trust shall be punished with imprisonment of either description for a term which may extend to three years, with a fine, or both.

Section 420: Cheating and dishonestly inducing delivery of the property.: Whoever cheats and thereby dishonestly induces the person deceived to deliver any property to any person, or to make, alter or destroy the whole or any part of a valuable security, or anything which is signed or sealed, and which is capable of being converted into a valuable security, shall be punished with imprisonment of either description for a term which may extend to seven years, and shall also be liable to fine.

Financial institutions also effectively resort to filing criminal cases under section 138 of the Negotiable Instrument Act (N.I Act) 1994. Cases under the N. I Act. 1994 are sometimes obtained by commercial banks while allowing loans. The cheques are a commitment to repayment of the loan. If the cheque is returned unpaid, the lending institution can sue under the N.I Act, 1994.

A loophole in Laws related to the recovery of NPL

There is a famous maxim, “justice delayed is justice denied”. This can be applied to banks, especially in developing countries like Bangladesh, owing to corruption and opaqueness in the settlement process and poor enforcement of laws that

usually create a fertile ground for wilful defaulters. In the case of Bangladesh, although several laws have been enacted and amended to ensure the safety and soundness of the banking system, the banking sector still witnesses an alarming amount of NPLs. Therefore, measuring the actual performance of different courts in terms of the number of suits filed, settlement rate, and recovery rate of NPLs over the years would be meaningful.

Banks in Bangladesh are burdened with heavy non-performing assets. Banks are endeavouring hard to find ways to recover non-performing loans. The Money Loan Court is likely the last resort for Banks to realise their dues. The total number of suits filed in Artha Rin Adalat of the country stood at 207896 at the end of 2021. During that period, only Tk.1970.3 million, i.e. only 28.13%, was actually recovered against settled suit value of Tk.7000.0 million. The suit value of filed cases in the Artha Rin Adalat is Tk.14369.4 million.

The court's recovery performance is totally disappointing. It is more interesting that the settlement ratio is satisfactory, but the recovery ratio is dissatisfactory, which shows the ineffectiveness of the legal framework.

For the people who are willing defaulters, loans appear to be obstacles to settling these cases. They secure stay orders from the court not to allow the case to be disposed of. As a result, these cases remain pending for years and generation after generation.

Most of the cases filed in Artha Rin Adalat take time of about five to ten years to award a decree. However, granting a decree does not guarantee the recovery of money. After getting a judgement in favour of the bank, the bank will not have any effective measure towards recovering bank dues by selling mortgaged property. In the absence of mortgaged property, upon appeal of the banks, the learned court passes the order of warrant of arrest against the judgment debtor. When the learned court passes an order of arrest warrant, then the judgment debtors come forward forthwith towards adjustment of liabilities (see Case Study 01 and 02)

The primary function of Artha Rin Adalat appears to be passing a judgment and arranging an auction sale of the mortgaged property. If the court fails to sell the mortgaged property through auction due to lack of a buyer of the property, then the court will bestow the unsold property to the plaintiff bank by transferring the property title. As a result, the borrower's liability remains unadjusted indefinitely. In the case of a warrant of arrest against the Negotiable Instrument Act, the borrowers come forward quickly to adjust their liability to avoid arrest. As Artha Rin Adalat cannot pass the warrant of arrest before selling the mortgaged property, the cunning borrowers have the scope to delay the court process either for cursory reasons or by the High Court's stay order.

Besides the Money Loan Court, banks have another option to take legal action against defaulting borrowers under the Bankruptcy Act. Since the enactment of the Bankruptcy Act in 1997, the court's performance has been disappointing. It is said that the intense lobbying of the defaulters deliberately slowed down the functioning of the law. The performance of recovery is 11.95% of the total claim. Banks are less interested in resorting to the Bankruptcy Court. Moreover, the court's performance, like Artha Rin Adalat, is disappointing.

The performance of the PDR Act is also reportedly dissatisfactory. The recovery under the Act is a small portion of total NPL, which does not play a significant role in the recovery of NPL.

This situation demonstrates the ineffectiveness of the legal framework in tackling the problem of bad loans.

The main hindrance to recovering default loans at this moment seems to be the poor enforcement status of laws and the slow execution of decrees. In this connection, it must be mentioned that the law itself is not solely responsible for the delay in settling cases related to NPLs; rather, a number of parties, such as plaintiffs or complainants, defendants, lawyers, and judges, are also involved in the process.

The default borrowers get privileges to file a writ petition against the bank's claim. In some instances, the borrowers file several writs against a particular case. An investigation reveals that about 95 per cent of judgments passed by the Money Loan Court are hanging through stay orders/injunctions imposed by the higher courts. Less than 5 per cent of all cases filed by the banks in the Money Loan Court end up successfully realising the money.

The detention order against the default borrowers passed by the Court does not reach the concerned Police Station in a timely and proper manner. Even if it reaches the concerned Police Station, the law-enforcing agencies do not take the desired action. The law-enforcing agencies do not even inform the Court regarding the position of default borrowers. In this process, many cases remain stuck.

It is observed that the colossal loan delinquency of the Bangladesh banking system reflects, among other things, the weakness of the legal infrastructure, which cannot ensure lenders' recourse on borrowers. The inefficacy on the part of the legal system also sometimes encourages borrowers to refrain from paying legitimate dues to the banks. The main hindrances in Bangladesh seem to be the existing legal framework and its lengthy procedures. These legal measures are time-consuming, resource-draining and ineffective, resulting in poor recovery performance.

Analysis of Facts and Data

Data analysis and different interviews with experienced bankers reveal that the loan recovery process is more effective in court if the court passes a warrant of arrest.

As there is much scope on the borrower's part to delay the process of Artha Rin Adalat, a necessary amendment in the law is needed to expedite the recovery process of NPLs. It is observed that the main focus of the Artha Rin Adalat is to sell the mortgaged property rather than recover the bank's claim. If the Court fails to dispose of the property due to a lack of buyer, then the court will complete its job by bestowing the mortgaged property to the bank and transferring the title of the property in question. As a result, banks cannot proceed further to recover their dues.

It is also observed that the recovery rate through the court is more satisfactory in the case of a loan allowed without any collateral security than in a collateralised loan. So collateral security appears less critical to the bankers only because of loopholes in the law. It is observed in many cases (see Case Studies 1 & 2) that the borrowers come forward immediately to settle the liability to the bank after the court issues a warrant of arrest.

Case study 1

A 100 % Export Oriented Readymade Garments Industry used to manufacture and export Ready Made Garments to different countries. They started banking with a bank in 2005. They were enjoying a composite limit facilities of TK.150.00 million comprising BTB L/C and Packing Credit. Later on, they were allowed a Term Loan of TK.23.00 million. There was a collateral security of Tk.50.00 million. Later, due to non-compliance rules set by foreign buyers, their RMG business was shut down, and they failed to repay the bank dues. In 2014, the client approached the bank for partial adjustment of their liability by selling mortgaged properties and factories. As per the Bank's approval, the client adjusted Tk.30.00 million. The client could not run their business, so their account became stuck. As a result, the bank initiated legal action against them to recover the classified liability. The bank filed a legal suit before Artha Rin Adalat in 2016 and got a decree in 2017. As the client did not pay off their liability, the bank filed an Execution Suit before the same court in 2018. However, the client refrained from adjusting their liability. The court issued a warrant of arrest 2019 against all company directors, which the client stayed in the Honourable High Court. The bank vacated the stay order in 2020. The Artha Rin Adalat again issued a warrant of arrest against all company directors. Finally, all the directors came forward with the necessary down payment to settle their liabilities by executing their sole name.

Case study 2

An export-oriented RMG unit has been banking with a bank since 2005 by availing composite investment facilities. Due to non-payment of their liabilities, the account became classified in 2009. The bank filed a lawsuit before the Artha Rin Adalat in 2009. In 2011, Artha Rin Adalat passed a partial decree to pay the principal amount of Tk.37.00 million without a claim of interest thereon. Subsequently, the bank filed the First Appeal in 2011 before the Honourable High Court Division, Supreme Court of Bangladesh, against the Judgment and decree of the Artha Rin Adalat. The Honourable High Court, vide their order dated 11.03.2020, passed a Judgment in favour of the bank, directing the defendants to pay the entire claim of Tk.40.00 million along with 12% pendent late interest from the date of filing suit till disposal of the suit within one year in 4 equal instalments. As the client didn't pay the decretal amount as per the order of the honourable high court, the bank filed an Execution Suit before the court of Artha Rin Adalat in 2021. In the process of execution suit, the honourable court issued a warrant of arrest in 2022, giving five months' imprisonment against the Judgment Debtors. Accordingly, they were arrested in 2022. One of the Judgment debtors has been awarded bail for one month to give 25% of outstanding liabilities to the bank within one month, while other Judgment Debtors will remain in prison. Finally, the client paid a partial amount and agreed to pay off all of the bank's dues under *solehnama*.

Findings

1. The total number of suits filed in Artha Rin Adalat of the country stood at 207896 at the end of 2021. During that period, only Tk.1970.3 million, i.e. only 28.13%, was actually recovered against settled suit value of Tk.7000.0 million. On the other hand, the suit value of filed cases in the Artha Rin Adalat is Tk.14369.4 million, against which only Tk.461.0 million was recovered. That means only 3.29% was recovered against the claimed amount through Artha Rin Adalat. It is a proven matter that Artha Rin Adalat is inadequate in preventing NPL or cannot ensure recovery of NPL of commercial Banks of Bangladesh.
2. Most cases filed in Artha Rin Adalat take about five to ten years to award a Decree. However, awarding a decree does not guarantee the recovery of money. After getting a judgment in favour of the bank, the bank will not have any effective measure towards recovering bank dues by selling mortgaged property. Whereas in the absence of mortgaged property, upon appeal of the bank, the learned court passes the order of warrant of arrest against the judgment debtor. When the learned court passes an order of arrest warrant, the judgment debtors come forward forthwith towards adjustment of liabilities.

3. The people who are willful defaulters, in those cases, loans appear as obstacles in the settlement of these cases. They secure stay orders from the court not to allow the case to be disposed of. As a result, these cases remain pending not only for years but for generations after generations.
4. The primary function of Artha Rin Adalat appears to be to pass judgment and arrange for the auction sale of the mortgaged property. If the court fails to sell the mortgaged property through auction due to a lack of buyer of the property, then the court will bestow the unsold property to the plaintiff's bank by transferring the property title. As a result, the borrower's liability remains unadjusted indefinitely. Upon passing a warrant of arrest by Artha Rin Adalat or the Court of Negotiable Instrument Act, the borrowers come forward quickly to adjust their liability to avoid arrest. As Artha Rin Adalat cannot pass the warrant of arrest before selling the mortgaged property, the cunning borrowers have the scope to delay the court process either for cursory reasons or by the High Court's stay order.
5. Banks always take Promissory Notes as a charging document before disbursing a loan. Like a Cheque, a Promissory Note is also a Negotiable Instrument. But no suit against that Promissory Note is filed in Criminal Court. As a result, the borrowers escape brutal punishment.
6. The number of money loan courts and judges in the country is inadequate compared to the demand. Both the loan givers and takers are suffering because of the pending cases.
7. The bank can sell the mortgaged property directly if it is authorised by dint of Authority for sale executed by the mortgagor/owner. However, the bank cannot successfully recover its dues by practising that authority as per section 12 (3) of Artha Rin Adalat Ain 2003, as the defaulter borrowers successfully manage the order of the higher court of law on the process of the bank. That is why the section of that law has become almost ineffective, leading the banks to augment the number of suits in Artha Rin Adalat.

Limitations of the study

There are some limitations involved in the study, such as:

There was a time constraint. The report was required to be completed within a short period. Only a few interviewed persons on the matter came under the report. The bankers generally do not disclose the inherent causes and sensitive data, especially on NPL.

Recommendations

It should be considered criminal activity by the borrower if the borrower does not repay the loan within the promised schedule. In that case, Artha Rin Adalat should be empowered to issue a warrant of arrest against the borrower/guarantor at any stage of the suit.

The holder's interest in the due course of a dishonoured Promissory Note should be protected like that of a dishonoured cheque through the N.I Act and/or other related laws.

As the writ petition seeking a stay order against the bank's claim is an excellent barrier to speedy case disposal, it may be adequate to impose a mandatory deposit provision on some portion (at least 10%) of the bank's claim for filing each writ petition.

Suppose it is proved that the mortgagor deliberately transferred their property to anybody before creating the mortgage. In that case, Artha Rin Adalat might punish him by imprisonment at any stage of the suit.

If it is proved that the Miscellaneous Case (Misc. Case) was filed by the defendant or any third party to delay the process of the suit, Artha Rin Adalat may issue an order of punitive action against the miscreants.

The number of Money Loan Courts should be increased, especially for Dhaka and Chattogram. A High Court bench in the Divisional Headquarters should be established to dispose of money matters.

Once the mortgagor confers authority upon the bank to sell the property in case of default, the bank's selling process must not be challenged by anybody, even by the higher court of law.

Conclusion

The banking sector of Bangladesh is a significant sector that significantly contributes to GDP growth. At the end of December 2020, the country's loans and advances were Tk.11239.22 billion of 10752 Branches under 61 Banks (6 State-owned, 3 Specialized, 9 Private Foreign, 43 Private). The economy has a burden of huge non-performing loans, which stood at 9.4% as of September 2022, which appears to be double that of international standards. It is, therefore, imperative to diagnose the causes of NPL so that preventive measures are taken and appropriate steps are identified to reduce NPL of banks.

If the loans become non-performing, bankers cannot go for foreclosure immediately, as there are so many bars in the liquidation of the collateral security like prolonged legal process, countersuit by the borrower, inadequate and wrong documentation, lack of buyer of security, third party's claim on the security etc. The government and banks take different preventive measures to address all causes

of NPL. However, to exert the best efforts, it is necessary to determine the main reasons for NPL. It is presumed that the relaxation of the law is the main reason for the increasing NPL in the country. The study was designed to analyse whether the relaxation of law is the main reason for the growing NPL of commercial banks in the country. The study's findings and recommendations will help streamline the NPLs of Bangladesh, which may be a path to salvation from Bangladesh's default culture.

Bangladesh was the 35th largest economy in 2022, with a GDP of USD 460.8 billion. It is the fastest-growing economy in the world. The country's per capita income increased to USD 2,824. Bangladesh's economy's growth rose to 7.25% in the 2021-22 fiscal year from 6.94% the previous year. However, the NPL ratio is at the bottom level of countries in the world, which is 9.4% as of September 2022, which is not acceptable.

From my above analysis, I believe that the relaxation in law is the main reason for the increase in non-performing loans of commercial banks in Bangladesh. So, policymakers may take steps per the recommendations cited in the report to eliminate Bangladesh's NPL problem.

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Assessing Savings Position for Financial Safety of Ready Made Garments Workers in Bangladesh

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Abstract

The RMG industry has made significant strides and played a role in the socioeconomic development of Bangladesh in many ways. This sector has positioned itself as the pioneer manufacturing sector and employer in Bangladesh, with huge industrial competitive advantages. The unprecedented growth of this sector also made Bangladesh proud as the second-largest exporting nation in the global apparel trade. Many socioeconomic changes were observed based on the growth of the RMG industry, which had multiplier effects. A study was conducted to evaluate the socioeconomic status and formulate an asset-based socioeconomic index proxy using wide-ranging assets. Financial assets like income and savings are very critical variables. Savings indeed play instrumental roles in drawing socioeconomic effects. Since RMG workers rely on subsistent earnings, it often causes many challenges in maintaining a decent and comfortable living. Savings in banks are considered critical for improving their living standards as strong financing is the root of dealing with better lives containing vulnerabilities. Considering this inevitable asset for the improved living of RMG workforces, there is no research regarding the bank saving state of RMG workers. Some academic works found the need for better income, a better living wage, and the necessity of saving to secure the future of the post-retirement needs of workers and their families in local and regional contexts. Low income has always been an issue that limits the savings of industry workers to some extent. Above all, gender-based income disparity is partly responsible for the weak saving trend. Conventional composite welfare indices like HDI and

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MPI also do not consider savings and other key variables for socioeconomic status assessment. This research attempted to identify if the RMG workers have the capacity to save upon meeting all living expenses due to limited earnings. In the quantitative and exploratory research, the questionnaire technique received categorical responses in binary format. 150 samples were chosen from 4 RMG clusters: Dhaka, Savar, Gazipur and Narayanganj. The core variables of primary data were analysed through frequency distribution, mean and cross-tabulation. However, 70.7% of employees save money through Banks and NBFIs, and 29.3% of employees do not save. A gap between the saving rate of industrial workers and the national savings rate was measured. We found that 98% of low-income employees save, while 2% of high-income employees do not save—82% female and 18% male, indicating a large female share. In housing conditions, the percentage is higher for employees with unimproved housing. It was evident that RMG workers save money for a brighter and safer future amidst the fiscal shortcomings.

Keywords: *Generalised System of Preference (GSP) · Ready-Made Garments (RMG), Human Development Index (HDI) · Multidimensional Poverty Index (MPI) · Non-Banking Financial Institutes (NBFIs) · Household Income and Expenditure Survey (HIES).*

1. Introduction

The RMG sector contributes approximately 83% of Bangladesh's total export earnings (Uddin, 2022). Hence, Bangladesh earns the highest amount of foreign currency through the RMG Sector. The RMG sector is the highest export earner in Bangladesh at the moment. During the last two decades, this sector has remained unparalleled, outperforming other sectors in Bangladesh's export trade. Low labour cost is often cited as a primary strength behind the growth of the RMG industry in Bangladesh (Mostafa & Klepper, 2018). Since the 2010s, the RMG sector has become the second largest exporter after China in the \$700 billion global RMG export market. With this sector's rapid industrialisation and export growth, our economy has come across substantial improvements, including GDP growth and socioeconomic development. The relentless growth of the RMG sector through business and employment has caused a massive positive change in both social and economic indicators. In a labour-abundant economy like Bangladesh, the RMG industry has been playing vital roles in socio-economic improvement through foreign earnings, employment of vulnerable people and regular income for the elimination of poverty and acting as the driving force in the economic development journey (Rahman & Siddiqui, 2015).

This sector has helped increase per capita income, reduce extreme poverty, reduce living standards of people and minimum income disparity, eradicate rural poverty, and promote rapid urbanisation through livelihoods to millions of people

nationwide. Employment in this sector has grown over 4.2 million by 2020 from 4 million in 2015. More than 1.8 million employees are men and 2.5 million are women (Islam, 2021). RMG exports reached \$46.99 billion in FY2022-23 with 10% growth over the past year (epb. gov.bd).

Since the garment industry is the only dominant industry in Bangladesh, this sector has generated multiplier implications across the society and country regarding gender equality, income distribution, social inclusion and, women's emancipation and empowerment, non-discrimination to a large extent. Apart from the contribution of RMG export earnings to the economy, the income of the RMG workers keeps moving the economic cycle and local economy. At the same time, Bangladesh's exports are less than half of that of China, around USD137 billion, the world's top clothing exporter and importer. This illustrates how significant this sector is in our economy. Bangladesh Bank reported that RMG export-earning marked a 10.35% contribution to the GDP of Bangladesh in FY2023 (Modak, 2023).

In addition to foreign exchange reserve generation for the nation, the RMG sector is the second-largest employer in the economy after the agriculture sector. It employs the most women in Bangladesh in formal employment (Asian Centre for Development, 2021) (Labour Force Survey, Bangladesh, 2016-17). This sector is providing livelihoods to millions of people nationwide. The average household size of RMG workers is above 4.5 members. Traditionally, 95% of employees are migrant workers, including male and female workers from different parts of the country. These employees also contribute and support their families in rural areas, resulting in rural poverty cuts, and 63% of household heads are male. Though RMG sector employees have gradually supported local industrialisation and relentless export-earning, many challenges have grappled with industry workers' smooth and decent living. They often face wide-ranging challenges from low-income, irregular payment, job insecurity, unhygienic work and living-condition and deprivation of many fundamental rights, including inadequate healthcare and minimum employment-related-legal rights, which cripple the social recognition of RMG workers. There is a mixed observation regarding the required socioeconomic development of RMG workers since many development indicators or measures like GDP, Physical Quality Life Index (PQLI), Human Development Index (HDI), Inequality-adjusted HDI (IHDI), Human Poverty Index (HPI) and poverty measure largely failed to determine and analyse the socioeconomic development of industrial workers in a broader perspective. These indices primarily deal with a limited number of factors and dimensions which do not demonstrate a clear view of the socioeconomic reality of the industrial class. Instead, these indicators give a national sketch of human welfare instead of a comprehensive view of

industry workers. The income and expenditure data are rarely recorded, are largely confidential, and are available in the national database. The sources of these data are often unreliable. As a result, the income-based socioeconomic development assessment of RMG employees is complex. Conventionally, the wage of RMG workers is TK. 8000, equivalent to USD95, is one of the lowest in Asia and among key RMG-producing and exporting economies, including China, Vietnam, India, Indonesia, and Sri Lanka. The new wage commission has elevated the existing minimum wage, which is expected to be effective in 2024, though this wage does not reflect comfortable and subsistent living conditions. This wage is not commensurate with the growing cost of living in this context. Despite various sub-economy challenges, RMG employees are surviving and steering the growth of this sector with multiplier socioeconomic impacts. We have often seen small incomes help manage the struggling and hard-feasted living of RMG workers and their dependents to some extent. Savings are an economic asset that helps people of all walks in many ways.

Regarding the saving attitude of RMG workers, Frank et al. (2023) found a link between saving attitudes about personal financial planning and retirement planning and the financial literacy behaviour of Solapur and Pune in India. The export-earning of the RMG sector heightens our foreign exchange reserve and national savings in the country. The savings after the disposable earnings of working people often led to savings in the Banking sector and economic stability. The savings attitude of low-income working people is naturally weak enough to shield their miseries, though the value of the savings is fragile and volatile. HIES 2022 reported that the institutional saving by mass people rate is around 14.12%, meaning at least one person is in each household. Bangladesh Economic Review (2023) reported a saving to GDP rate of 30.22% in FY2023. Though it doubts the statistics do not specify all savers, the share of low-income group industrial workers. The savings report also does not retain and disclose the contribution of RMG workers to the national savings. Considering the importance of socioeconomic development, the huge workforce, and the mover and shaker of this sector, income and savings information play vital roles in securing improved socioeconomic conditions. The regular income and savings by RMG workers critically ensure safe and better living conditions for workers and their family dependents. With this view, learning and identifying if the country's primary industry workers have a savings mindset and rate of savers across the RMG workers is inevitable. This learning and industry-saving scenario helps to understand the fiscal solvency and strength of low-income group livelihoods, which in turn helps to know the labour productivity of RMG workers and their efforts to the national economy. The saving spree of RMG workers also enables policymakers to know their income

and savings perspective and the required activities and planned development of industrial workers who remain in the low-income rung of different occupations. Socioeconomic development can be measured using assets as the proxy measure of the working-class people. Conventional poverty measures and indices failed to determine the low-income RMG workers' overall welfare and socioeconomic position.

According to Apparel Resources News-Desk (2018), GoB formulated a rule under the labour law in 2016 for the mandatory contribution of .03% of export proceeds of RMG exporters considering the fiscal need and support of RMG workers in case of illness and physical health needs supported by BGEMA. It is often noticed that many factories do not contribute to this fund. Bhuiyan (2012) narrated the present socio-economic status of the apparel labour of Bangladesh. It was extracted that RMG workers are underpaid. Employees hardly rely on this fund as it is limited to health matters, and this information has not become very widespread. With regards to RMG workers, there have been many studies ranging from socioeconomic factors determination, living conditions, workplace-related matters, discrimination, job dissatisfaction and women's work conditions, socioeconomic development of women workers and the role of the RMG sector in national employment and economic development. In addition, the relationship between income and living conditions and gender-based income differences was also studied in both academic and industrial literature. No academic or empirical research study has been conducted on the savings trend of RMG workers in Bangladesh despite it being an inevitable area of focus in the socioeconomic context.

2. Background of the study

Bangladesh's ready-made garments (RMG) sector has emerged as a global powerhouse, securing its position as the world's second-largest Garment exporter. The phenomenal growth of this sector, marked by a CAGR of 10.27%, propelled Bangladesh to become a key player in the global textile market. However, This economic boom comes with a complex set of challenges, particularly concerning the living conditions and wages of the 4 million workers in the sector (Syed, 2020). There are manifold challenges for the RMG sector about the external market and local market competitiveness. Local industrial readiness involves industrial safety, occupational health and safety, and structural safety for sustainable industrialisation. On the other hand, labour welfare is always the centre of attention in the industry. Moreover, labour welfare is associated with the socioeconomic development of workers. It has been evident that RMG workers are spared from extreme poverty due to regular and consistent wage income despite the relatively

low wage for operational workers. The survival of RMG workers is intricately linked to the sustenance of this global industry, as they serve as the lifeline crucial for its continuation. Our RMG workers earn less than that of many RMG exporting nations. With this low income, they maintain their lives and their families. Despite immense struggles and hardships, they sustain and support their living. Income is the root of all sorts of welfare-related activities of RMG workers. The soaring cost of living is another pressing concern that holds back the desired socio-economic development of industry workers. The national average expenditure of people is less than the reported national average income. The average household expenditure is Tk. 41,424 against the average income of Tk. 45,757 in the urban area. The average income of the RMG workforce is below this benchmark (HIES,2022). RMG sector growth reduced the urban and overall headcount poverty to 5.6%. Despite its economic contributions, the labour of the RMG sector faces stiff challenges, such as rising living costs and decent living standards.

After disposing of expenditures for future safety, RMG workers require decent earnings and savings. In the changing and growing living standards and uncertain future, industry workers must have financial security to support their families, expenses, and other needs in urban living standards, such as healthcare and education and a safe retirement life. Therefore, it is inevitable to ensure savings in banks or NBFIs to cover future needs. While RMG sector employers predominantly disburse salaries through banks, many workers opt for institutional and informal savings within their families. The impending expiration of the Generalized System of Preferences (GSP) further compounds the industrial challenges. Despite the significant contribution of this sector, the disparity in wages persists, with workers receiving meagre pay. The low-income workers struggle to afford daily essentials, highlighting the urgent need for improved wages as food inflation hit a 12-year high of 12.54% in August 2023 (BBS,2023). In addition, approximately 60%-70% of the RMG workforce comprises women, underscoring the sector's significance in empowering women workers (Alamgir & Banerjee, [2019](#)). The positive impact of employment is overshadowed by exploitative conditions such as wage gaps, low salaries, irregular payments, and job insecurity. Despite the contribution of female labour to this sector, existing labour laws offer limited protection for labour. According to Wani (2019), socioeconomic status (SES) is one of the critical factors affecting the health of an individual or a family. This profile is analysed by various variables responsible for income, education, occupation, physical assets, social position, social participation, caste, political influence, and muscle power. EPS (2007) The Economic Profile System was designed to produce detailed socioeconomic profiles at various socioeconomic scales, including employment and personal income by industry, average earnings, retirement and other non-

labour income and earnings by industry.

The demand for a fair salary for RMG workers has gained momentum as labourers perceive it as crucial to fuel our economic engine. IBC survey in 2016 found that 64% of RMG workers did not earn enough for their basic needs, and 77.2% resorted to overtime to compensate for inadequate wages. CPD (2018) reported that RMG workers' living expenses have increased by 85%, and workers' non-food expenses have mounted significantly compared to food expenses. These are holding back the scope and potential of saving for future prosperity.

The Human Development Index (HDI) is a tool for assessing a country's development. It comprises a country's main attainments in terms of a long and healthy life, knowledge, and a decent standard of living. The wealth index was constructed using principal components analysis (Vyas & Kumaranayake, 2006). The wealth index cannot justify the impact of income and savings on future income.

Most studies on socioeconomic status dealt with health-related matters, including expenditures. Filmer and Pritchett (2001) discussed the asset-based household strengths for child enrolment in India.

The minimum wage was set by TK. 8,000 in 2018, and the RMG sector witnessed significant development. The new minimum wage structure 2023 sets the minimum wage for unskilled garment workers at Tk.12,500, equivalent to \$113.6 (at the current dollar rate). However, BGMEA anticipated potential challenges. Though this is the low wage rank, the top minimum wage tier workers would be higher around TK. 28000, equivalent to \$254.84 (at current USD rate). If this wage is implemented, employees may better cope with the growing living expenses to some extent. Of the workers in the RMG Sector, over 50% of employees are junior operators, operators and machine operators, cleaners, and iron operators, which belong to the low-income bracket TK.12,500 and maximum TK.14,750 in grade 5 (Minimum Wage Board, 2023). RMG workers demanded minimum wage TK. 23,000, leading to protests by RMG workers with high expectations from the government (Khatun, 2023). Adding to the Bangladesh Centre for Workers Solidarity, RMG workers' wages increase by 5% annually while commodity prices increase much more. Many workers revealed that rising prices forced them to opt for low-quality fish options (Hossain, 2022).

The wage gap becomes even more apparent when compared to neighbouring countries. The labour cost of Bangladesh is around US\$95, which is much lower than US\$518 in China, US\$234 in Vietnam, US\$170 in Cambodia and US\$150 in India, and US\$107 in Pakistan, the competitors of Bangladesh in RMG export trade (Hossain, 2018). The minimum salary for a cleaner on the government pay scale is Tk15,250, while a garment worker's minimum wage is Tk.8,000. According to a Survey Report on the Garment Workers of Bangladesh (2020), the monthly family

expenditure per household is Tk. 16,596 against their monthly family income of Tk. 23,699 (ACD Survey, 2020). Approximately 60% of workers rely solely on the garments industry for their livelihood, and workers from other supplementary income-generating sectors- agriculture, fishery, livestock, and sewing. (Moazzem et al., 2018).

Overall, the cost of living has surged annually by 17.2% between 2013 and 2018, outpacing the growth of the national consumer price index. Living standard disparity is evident across different RMG hubs in Bangladesh due to diverse demographic and economic conditions in different cities and industrial areas. The cost of living in Dhaka, Narayanganj, and Gazipur varies according to house rent, utility bills, living standards, healthcare standards, and amenities. Family size significantly influences expenses, with larger families incurring higher costs. To ensure the smooth and recognised socioeconomic condition of RMG workers, saving may help attain a good living and socioeconomic position.

Income is an essential factor in the socioeconomic profile of RMG workers. Despite having various works on the socioeconomic condition of RMG workers, savings opportunities, outcomes and benefits were least attended. In this context, there is no work to ensure the savings profile and savings state of RMG workers since they work in a low-income occupation but in the mainstream industry in Bangladesh. The livelihood issues include accommodation challenges, limited household assets, financial liabilities, and lack of basic public facilities and amenities, which portray the multifaceted challenges RMG workers face beyond their living expenses (Moazzem & Radia, 2018). Due to unreliable, multifarious data on income and expenditure, socioeconomic measures could not be developed as income does not represent and affect variables of socioeconomic development. Therefore, asset-backed socioeconomic status checks were a priority in social science. The country's per capita income is incremental, but the growth of RMG wage is far from the GNI per capita. As Bangladesh strives for further economic growth after LDC graduation in 2026 through the growing RMG sector, the study on income-led saving trends and the position of RMG workers would present the fiscal strength of RMG workers. Savings are also aligned with improving workers' living conditions and socioeconomic welfare.

3. Problem Statement

The RMG sector in Bangladesh has emerged as a significant contributor to the economy, playing a pivotal role in employment generation and export earnings. However, a critical concern within this industry is the glaring income inequality among workers, which seriously threatens their survival and well-being. The rationale for conducting this study lies in recognising the pressing socio-economic

issues prevailing in the RMG sector, focusing on the persistent problem of inadequate wages. The importance of investigating this issue stems from the profound impact on the livelihoods of workers, specifically through the consequential reduction in disposable income. The RMG sector plays a crucial role in the global economy, and the well-being of its workforce directly influences the overall welfare and sustainability of this sector. Secondly, the ongoing struggle of workers to secure a decent standard of living despite their contributions to society raises concerns about social justice and fair labour practices. Moreover, RMG labourers are forced to work long hours with limited sick leave, holidays, vacations, pensions, bonuses, festival allowances, and trade unions (Islam & Zahid, 2012).

The low wage in this sector has been identified as a critical factor leading to the financial safety of workers, affecting their ability to meet basic needs such as housing, sanitation, education and healthcare. Inadequate income results in a struggle to deal with contingency-carrying debt or involvement in financial deals (Lusardi, 2011). The minimum wage in the RMG sector, while a crucial step towards safeguarding workers' rights, is insufficient to meet the basic needs of the labour force. Despite several revisions to the minimum wages over the last decade, the livelihood conditions of workers, particularly regarding their housing, children's education, and health, remain poor. A large section of workers regularly borrowed loans from informal sources for sustenance (Moazzem & Arfanuzzaman, 2018). This study dealt with the disparity between rising wages and actual living expenses, investigating elements that contribute to the limited disposable income of workers. However, the national average income is Tk. 15,988, according to HIES 2016. The income groups were recorded into two groups based on employees' income level. We have realised a discrete number as the value of the salary.

A study on Thai industrial workers in the Mincerian wage equation and its impacts on wages by Wannakrairoj (2013) provided an indication and outcome that a positive relationship is found among the Thai labour's education, experience and income. One of the primary concerns is the ongoing struggle of workers to secure a decent standard of living. The cost of essential goods and services continues to rise, eroding the purchasing power of the increased wages. Due to such a financial crisis, they cannot fulfil their basic needs (Narayan & Patel, 2000). They are not concerned with food, clothing, accommodation, health and hygiene. This deprivation not only impacts their well-being but also acts as a catalyst for social delinquency despite their significant contributions to society. Unfortunately, a considerable number, around 89% of garment workers, are not satisfied with their monthly salary (ICMAB, 2019). Considering this weak income and saving the context of RMG workers, this research aims to evaluate how inflation affects the well-being of RMG workers, potentially pushing them toward financial crisis and

compromising their ability to meet fundamental needs such as housing, education, and healthcare. Yeasmin (2023) revealed that RMG workers constantly face income shortages that hinder their future planning. Despite long working hours, the financial strength of low-income RMG employees lacks planning for potential income loss, unexpected costs, financial assets and retirement savings. ADB first absorbed the sustainable livelihood approach framework to assess sustainable livelihood based on five major assets: social, physical, financial, human, natural, and productive use (Krantz, 2001). It indicates that financial assets are essential for sustainable livelihood or socioeconomic development. Breza et al. (2020) found that in Bangladesh, paying garment workers' wages digitally gradually leads to increased account use and savings and greater financial capability. Approximately 85% of all salaried employees in developing economies receive their wages in cash. Despite having documented regular income, they often cannot open a formal financial account without an employer's help. 2.5 million digital accounts were opened by the RMG workers during the pandemic to receive the salary stimulus package of \$600. WEF (2021) reported that 62% of employees agreed to digital payment receipts and preferences. Despite having a structured wage rate and income plan, there is an income disparity due to gender-led income discrimination and many external economic factors, including labour unrest, low productivity, weak workers' management, and weak business turnover; wage discrimination often leads to dissatisfaction in work and low motivation.

In light of the above, this research attempts to address the critical issue of income inequality among RMG workers in Bangladesh. Their survival is challenged due to the absence of a living wage and their weak socioeconomic position. Amidst the low disposable income and rising cost of living experience of RMG workers, the research aims to understand and identify whether RMG workers can save after meeting for a decent living and safer future.

4. Research Question

Taking into account the research problem of the study, the core research question emerges from the given literature of relevant academic works, empirical analysis on income base and income discrimination of RMG workers; the research gap has been evident that no specific study to define the rate and ratio of savings by the RMG workers amidst their professional life. The research question is, can RMG workers save for safe and secure living conditions?

The overall objective is to critically examine the relationship between RMG workers' earnings and savings after meeting all living expenses.

5. Objectives of the study

The specific objectives are given below:

- To determine if RMG workers save money after meeting living expenses.
- To relate the savings rate by RMG workers with the national saving rate.

6. Scope of the work

This study mainly considered primary data from a survey of factory workers in major RMG clusters. Blue-collar workers are the primary targets. Socioeconomic conditions through Bank savings by the workers are the main scope of work. No personal saving mode is considered; it is an institutional mode of savings. This study was arranged with some data and findings of a primary survey on constructing a socioeconomic index to measure the socioeconomic status of RMG workers. The income and saving variables were extracted from that work to disseminate key findings on the saving behaviour and state of RMG workers. No secondary data were used in this work.

7. Literature Review

This section assorted and explored the literature relevant to the proposed research, explaining this issue, different aspects of socioeconomic development and income-related disparity, limitations, different socioeconomic measures, and the impact of income. Haque et al. (2020) explored the women's current socioeconomic position at the workplace in the RMG sector in Bangladesh regarding wages, promotion, safety and security. This study had some remarkable findings: Though female workers were doing the same job, they were deprived of getting desired job postings, salaries and promotions due to their skills. Absar (2009) found that the RMG sector of Bangladesh has tremendous development in the world, though the wage pattern is not unsatisfactory for all.

HDI, the most renowned human welfare measure, must be supplemented by other economic and social cohesion indicators, sound development strategies, and other economic factors to be more reflective. The MPI-SL (Multi-dimensional Poverty Index) measures three dimensions of well-being: health, education, and standard of living (Alkire & Santos, 2010). These indices also exclude saving and fiscal security and do not address the needs of low-income industrial workers.

Yeasmin (2023) revealed that most of the RMG workers had a lack of knowledge about financial products and services. The reliance on informal financial arrangements and lack of resources for future savings contributed to a focused mindset among these workers. They struggled to meet their ends, rarely had money left, and struggled to maintain savings. They believed investment in land and animals is more profitable and easily accessible in emergencies than saving in financial institutions.

Huang and Lee (2015) studied low-income households of RMG workers. They found that people's experience of economic hardship was not related to financial literacy but instead relied on the external environment, i.e., access to financial services, planning and managing money. However, according to Rothwell et al. (2016), financial knowledge enriches the saving behaviour of low-income RMG workers. Kabir et al. (2022b) showed that increased wage, to some extent, improves savings and meeting capability. However, with ongoing price hikes of daily commodities and physical and psychological health challenges, workers could not realise any financial benefit to meet savings needs and emergencies.

Akhter (2022) mentioned that earnings from assets and savings are the major sources of economic security for a household to meet emergencies like unemployment. Bhattacharya et al. (2002) argued that the expansion of women's employment contributed positively to the improvement of the poor's savings behaviour since women tend to be better savers. Chowdhury and Ullah (2010) addressed the job satisfaction of female RMG workers, which was concerned with saving, duration of maternity leave, medical allowance, bonus structure, job environment, accommodation, education, etc.

In the study on RMG worker's status, Bhuiyan (2012) discussed the present socio-economic status of the garment workers in Bangladesh. Data on their income, job security, accommodation, education of their spouse and children, compliance, savings, bank deposits, and recreation were collected to measure their socioeconomic position. It was found that garment workers were underpaid. In the same way (Chowdhuri, 2012). identified socioeconomic status factors of RMG workers were health care, education, social security, attachment to a labour union, overtime, savings, job security, working hours, and fringe benefits. Shyam (2019) found that a highly educated RMG worker will likely have a good income from properties and savings temporarily. The nature of work may be informal, but income is secured. Shyam (2019) recommended that pension, a basic social security system for RMG workers, should be based on certain broad principles, viz. universal coverage benefit, equity, fairness, protection against poverty, replacement of lost income, and a guarantee of the minimum rate of return on savings.

Khanam (2021) states that financial benefits are prime employee motivational factors. After meeting the expected compensation level, their following demands are a good working environment, job security, savings plan, and social recognition, which need to be met by employers. However, fixing minimum wages in the RMG sector is challenging because employees are dissatisfied with the existing wage rate and unable to make small savings at the end of the month. Employers always claim that production costs are gradually rising and employees are struggling to

afford the additional cost of the minimum wages.

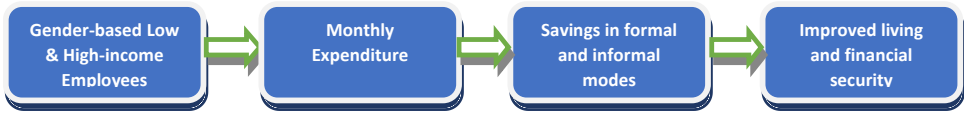
According to Hansen et al. (2021), due to uncertainty about the job apparel sector, income prospects and global impacts on the supply chain, RMG workers are in a terrible state. Despite that, the RMG industry allowed millions of young women who would not otherwise be employed in the global economy. Chilton et al. (2019) state that the RMG sector growth provided significant job and income-earning scopes for various people, especially young women. Against the drawbacks of income and expenditure data in SES assessment, the household wealth index was considered a reliable proxy for household economic status encompassing household assets, dwelling characteristics and consumer items possession in some South and Southeast Asian countries (Sreeramareddy et al., 2014). The average female worker receives little formal education in Bangladesh, Cambodia, and Vietnam. In addition to income generation and poverty reduction, this sector has also created indirect jobs in Cambodia (Han & Mah, 2015). Mustafa et al. (2016) mapped the socio-demographic profile of women workers in the RMG sector and assessed the impact of employment in RMG on livelihood change. They found that women RMG workers brought positive changes in different livelihood assets such as financial, physical, human, social, and natural capital. Almost 90% of women employees claimed income and savings increased after their employment with a contribution to society and the economy.

8. Research Gap and Conceptual Framework

To justify the relationship between RMG workers' income and savings-led socio-economic development in Bangladesh, various academic references are found that indirectly discuss the nature of socio-economic changes in the RMG sector. The various scholarly works on wide-ranging avenues of socioeconomic condition of RMG workers identified different works covering socioeconomic aspects, factors and their studies in Bangladesh, Asian contexts and women's welfare and their socioeconomic development. Income and savings factors were discussed along with other factors of socioeconomic development. The study has not focused on saving by industrial workers and whether RMG workers tend to save, as most studies cover their exploitation and other industry-related challenges. The savings of RMG workers seek due attention to whether workers can save after maintaining their major living expenses.

The inductive approach is required to make the conceptual framework for this work. Inductively, we collected relevant variables from relevant academic works, theories, and literature on income and saving and the need for saving for low-income industrial workers to ensure decent living and socioeconomic improvement. Since there is no knowledge and empirical evidence on how institutional savings lead to

the future safety of RMG workers, a process design of a Conceptual framework can be followed to show the relation of these variables considering income variables and the rate of RMG workers as savers.



9. Methodology of the Study

The study aimed to narrate income and savings trends for the better socioeconomic status of the RMG industry workforce and socio-economic development in Bangladesh. This study followed a survey research method, which required the researcher to find information from relevant industrial populations by using different sub-set features of the population.

This research is essentially quantitative. An in-person survey of target sample units was conducted using a survey research technique and questionnaire approach.

The epistemological assumptions concern the kind of possible knowledge and how this knowledge has become adequate and effectively legitimate (Blaikie, 2000).

Scientific knowledge is generated significantly from a positivistic paradigm in both natural and social science. The research question, respondents' selection, data collection tool, and data analysis are filled under the positivistic research paradigm. Due to the small diversity of the population, a two-stage stratified cluster with 150 samplings was used to adequately represent the samples in this work.

We used random sampling to select factories and to identify the sample units. Samples were collected from major RMG industry clusters like Dhaka, Savar, Narayanganj, and Gazipur.

Secondary data on RMG exports, GDP, industry size, poverty, employment, and household expenditures were referred from BGMEA, EPB, BKMEA, BBS, Bangladesh Bank, Export Promotion Bureau, Finance Ministry, and GoB database publications.

For primary data collection, the questionnaire with close-ended questions enshrining demographic features of the research respondents, employee income level, migration status, and savings was used. Different literature reviews on earning and saving helped to identify the variables that were empirically tested for the generalisation of new knowledge.

The survey questionnaire had 30 items, and six variables were shortlisted, analysed, and extracted to identify the population's findings. Marital status of the employees, Age, Gender, Residence style of employees, Migration status, Income level and Savings behaviour of employees. SPSS and MS Excel tools were used for data analysis.

10. Findings on data result and analysis

The descriptive analysis also covered the demographic variables and aspects of the RMG industry survey respondents. Later, the demographic features of the survey respondents, the frequency, mean, standard deviation cross-tabulation of Income state and frequency of Savings by employees are included. For different analyses of the relation of variables of factors, the relevant cross-tabulation has been shown below:

The Survey record on the housing condition of RMG employees and their housing or accommodation style has been classified into “Improved” and “Unimproved” housing styles based on four categories of standard housing: semi-pucca, shared house, rented house and own-house. One hundred four employees live in improved housing conditions, and the rest, 44, live in unimproved housing states. Table 1 below recorded that 14% of respondents, equivalent to 21, are Male, and 86%, equivalent to 129 employees, are female.

Table 1: Gender of Employees

| Gender | Frequency | Percent | Valid Percent |
|--------|-----------|---------|---------------|
| Male | 21 | 14.0 | 14.0 |
| Female | 129 | 86.0 | 86.0 |
| Total | 150 | 100.0 | 100.0 |

With regards to the age status of employees or respondents, it was found that 69, the highest number of employees, are from the age group of 31-40 years, followed by 40 workers from the age group of 41 to 50 years and 34 from the age group of 20-30 years. The lowest number of employees, 22.7%, was 20 to 30 years old. We have collected data on all employees’ ages for data classification; all discrete age numbers have been recorded into age groups. The average age was 36.35 years.

Table 2: Age of Respondents

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-----------|---------|---------------|--------------------|
| Valid | | | | |
| 20-30 | 34 | 22.7 | 22.7 | 22.7 |
| 31-40 | 69 | 46.0 | 46.0 | 68.7 |
| 41-50 | 40 | 26.7 | 26.7 | 95.3 |
| 51-60 | 7 | 4.7 | 4.7 | 100.0 |
| Total | 150 | 100.0 | 100.0 | |

Table 3: Marital status of RMG workers

| Marital Status | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Unmarried | 103 | 68.7 | 68.7 | 68.7 |
| Married | 29 | 19.3 | 19.3 | 88.0 |
| Divorced | 18 | 12.0 | 12.0 | 100.0 |
| Total | 150 | 100.0 | 100.0 | |

Regarding the marital status of employees of the respondents, it was viewed that 103 employees, equivalent to 68.7% of all samples, are unmarried, 19.3%, equivalent to 29 employees, are Married, and 18 equivalents 12% are Divorced and 0 Widows.

Table 4: Income position of RMG workers

| Income Range in TK. | Frequency | Percent | Cumulative Percent |
|---------------------|-----------|---------|--------------------|
| 0 to 80000 | 109 | 72.7 | 72.7 |
| 8001 to 15000 | 36 | 24.0 | 96.7 |
| 15001 to 22000 | 5 | 3.3 | 100.0 |
| Total | 150 | 100.0 | |

RMG workers get paid based on minimum wage. Based on the income data collected by RMG workers, diversity has been noticed in the income of all employees. The income data have been grouped into four classes. The highest number of RMG workers, around 72.7%, equivalent to 109, remains within the 1st or low-income bracket up to TK. 8000, followed by 24% of employees in the income bracket Tk. 8001 to TK.15000. The lowest number of employees, 3.3%, are attached to TK. 15001 to Tk. 22000 income bracket. Later, these four segments of the income bracket were converted into “Low” and “High” income groups. The low-income group has been denoted as those who earn less than TK. 8000 to maximum TK. Fifteen thousand employees with over 15,000 are treated as “High-income group” workers. The average monthly income of the employee is TK. 9068.67, and minimum and maximum income were Tk. 7,500 and TK.17,000 respectively.

Table 5: Income New and Gender Cross-tabulation

| | | Gender | | Total |
|------------|------|--------|--------|-------|
| | | Male | Female | |
| Income New | Low | 21 | 126 | 147 |
| | High | 0 | 3 | 3 |
| Total | | 21 | 129 | 150 |

The income data has been converted into income level. The cross-tabulation of the income level of RMG workers and gender to show their relation from Table 5 depicted that out of 147 low-income group employees, 21 are male and 126 are female. Besides, among the high-income group employees, there are three female and 0 male workers. Female employees are omnipresent as they belong to both Low-Income and High-income employees.

Table 6: Savings in Bank Accounts by RMG Workers

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|-------|-------|-----------|---------|---------------|--------------------|
| Valid | No | 44 | 29.3 | 29.3 | 29.3 |
| | Yes | 106 | 70.7 | 70.7 | 100.0 |
| | Total | 150 | 100.0 | 100.0 | |

Respondents were asked whether they could save money after meeting all disposable income. With recorded responses, we found that 106 employees, equivalent to 70.75%, can save money in the Bank, and 44 employees, equivalent to 29.3%, replied “No” as they cannot save. This number of Savings in the bank is remarkable among RMG workers.

Table 7: Savings in Bank Account and Gender Cross-tabulation

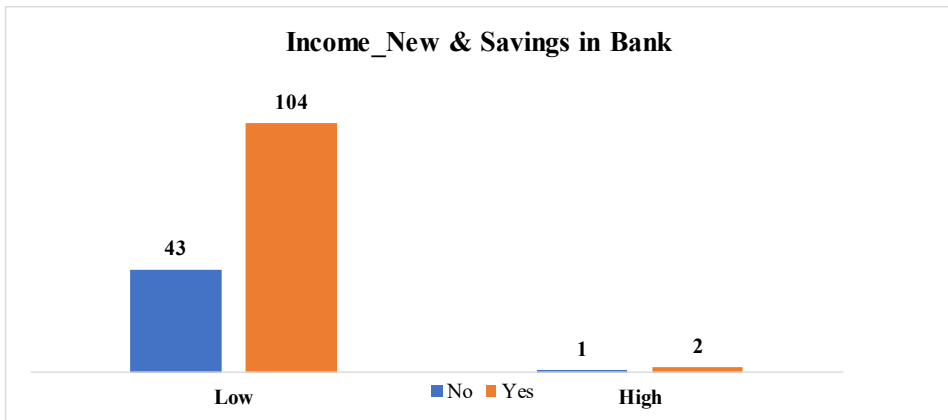
| | | Gender | | Total |
|-------------------------|-----|--------|--------|-------|
| | | Male | Female | |
| Savings in Bank Account | No | 2 | 42 | 44 |
| | Yes | 19 | 87 | 106 |
| Total | | 21 | 129 | 150 |

Table 7 states a cross-tabulation of Gender and saving and reports that two males cannot save and 19 can save in banks out of 21 male employees. Out of 129 female respondents, 42, or 32.56%, do not have savings in the Bank, and 87 female

employees, equivalent to 67.44%, can save money in the Bank after meeting their regular living expenses. It has been evident that female employees save more than male employees in the RMG sector.

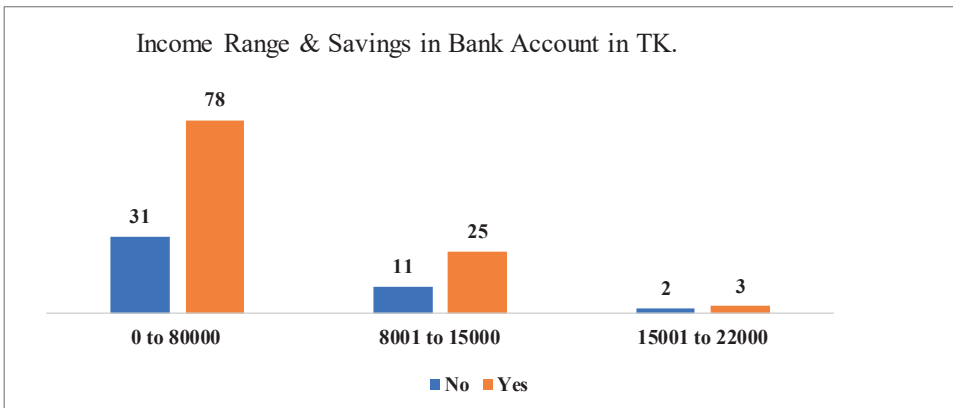
The relation of Income new status and Savings in Bank by RMG employees can define which income group workers are inclined to save more and which are not. Accordingly, it was found that out of 147 low-income group employees, 43 employees do not save in Bank, and 104 employees can save in bank or institutional mode. Among the three high-income group workers, only one high-income worker can save money, and the remaining 2 of 3 total high-income workers do not save money in the RMG industry. It has been evident that the saving tendency is higher among low-income workers.

Figure1: Income New and Savings in Bank Account



Source: Survey Report, 2023

Figure 2: Income Range and Bank Savings Cross tabulation



Source: Survey Report, 2023

*Table 8: Income Range and Savings in Bank Account
Cross-tabulation*

| | | Savings in Bank Account | | Total |
|---------------------|----------------|-------------------------|-----|-------|
| | | No | Yes | |
| Income Range in TK. | 0 to 80000 | 31 | 78 | 109 |
| | 8001 to 15000 | 11 | 25 | 36 |
| | 15001 to 22000 | 2 | 3 | 5 |
| Total | | 44 | 106 | 150 |

Cross-tabulation of the Income Bracket of RMG workers and Bank savings found that the highest number of savers belong to the low-income bracket TK.8000, as 78 employees replied positively, and 31 employees of this income bracket do not save. We found 11 employees who do not save in the following income range, while 25 put money in the banks. In addition, three employees save while two do not save among TK's third highest income brackets, Tk. 8000 to Tk. 15000.

*Table 9: Savings in Bank Accounts and Migration for
Livelihood Crosstabulation*

| | | Migration of workers | | Total |
|-------------------------|-----|----------------------|-----|-------|
| | | No | Yes | |
| Savings in Bank Account | No | 6 | 38 | 44 |
| | Yes | 14 | 92 | 106 |
| Total | | 20 | 130 | 150 |

Table 9 describes the cross-tabulation of workers' migration status and employees' bank savings. The tabulation extracted the number of bank savings by the migrant workers. Out of 20 non-migrants, 6 have no savings in the Bank, while 14 have savings in the Bank. On the other hand, out of 130 employees, 92 employees save through the Bank, and the remaining 38 do not save through bank accounts. It can be inferred that many migrants and non-migrants intend to save in the bank.

Table 10: Savings in Bank Account and Residence Type New Cross-tabulation

| | | | Residence type New | | Total |
|----------------------------|-----|-------------------|--------------------|----------|--------|
| | | | Unimproved | Improved | |
| Savings in Bank Account | No | Count | 17 | 27 | 44 |
| | | % Savings in Bank | 38.6% | 61.4% | 100.0% |
| | Yes | Count | 29 | 77 | 106 |
| | | % Savings in Bank | 27.4% | 72.6% | 100.0% |
| Total | | Count | 46 | 104 | 150 |
| | | % Savings in Bank | 30.7% | 69.3% | 100.0% |

Table 10 shows the relationship between Savings in the Bank and the household conditions of employees. There are 44 employees with 17 unimproved residence conditions and 27 improved residences who do not save money in the Bank. On the other hand, 29 employees with unimproved households save in the bank, while 77 employees with improved households save in the bank out of 106 employees.

Table 11: Migration and Savings in Bank Account Cross-tabulation

| | | | Savings in Bank Account | | Total |
|-----------------------------|-----|-------------|-------------------------|-------|--------|
| | | | No | Yes | |
| Migration for livelihood | No | % Migration | 6 | 14 | 20 |
| | | | 30.0% | 70.0% | 100.0% |
| | Yes | % Migration | 38 | 92 | 130 |
| | | | 29.2% | 70.8% | 100.0% |
| Total | | | 44 | 106 | 150 |
| | | % Migration | 29.3% | 70.7% | 100.0% |

The cross-relation of migration status and bank savings of employees reported that out of 20 non-migrant workers, 14 reported saving in the bank, while the remaining six reported not saving after meeting living costs.

On the other hand, 38 employees save in banks, and the remaining 92 cannot save in banks out of 130 migrant workers. It can be inferred that migrants have relatively weaker fiscal strength. For sustenance in their living in Dhaka and urban areas, they are more enthusiastic about saving to support the future. In case of job

loss due to factory closure, this saving will strongly back up the subsistent income-grouped workers.

11. Relating the Industrial workers' savings with national socio-economic data

The socioeconomic development report underscored that Bangladesh had made essential strides in various socioeconomic parameters like poverty reduction, life expectancy, literacy rate, and growth (Finance Division, 2022). The Ministry of Finance also pointed to the cut of hardcore poverty to 10.5% in 2019 from 24.2% in 2006 and women's participation in the labour force to 36.3% in FY2017. Women's participation and empowerment have significantly contributed to poverty elimination.

The Household Income and Expenditure Survey (HIES) regularly reports every five years, projecting household conditions to meet economic needs dealt with by the Bangladesh Bureau of Statistics (BBS).

HIES (2022) stated that household living status and socio-economic status improved. Key findings of the survey are that access to electricity increased from 75.9% in 2016 to 99.3% in 2022. 92.3% have access to improved sanitation, and 96.1% have improved water sources. The average income of each household has enhanced to TK. 32,422 in 2022, along with expenditure to TK. 15,715. Both food and non-food expenditures have increased by 45.8% and 54.2%, respectively, though the income of RMG workers has not escalated in line with this trend.

National socioeconomic statistics are believed to represent the industry population since national data is supposed to represent industrial employees. It helps to know the gap between socioeconomic status categories and the given national results. This needs to be addressed if there is any major difference in survey data on any socioeconomic variable and national socioeconomic status. We have found the resemblance in data of many variables like access to water, electricity and literacy between industrial and national grounds. However, other key asset variables of micro-level people, including industry workers, demand special attention to understand the accurate picture. The savings statistics by industrial workers can be checked against the national data on institutional or bank savings recorded to determine whether the industrial scenario is almost identical to the national context. HIES (2022) stated that the rate of people who prefer to save and deposit in micro and financial institutions is 21.30%. The surveyed data on this variable has been checked against this given rate to know the position of savings of RMG workers and the gap.

The survey on RMG workers reported that 106 equivalents, 70.7% of the given sample units, while 29.3% reported having no bank accounts. The industrial

workforce survey resulted in a sizable gap between the results of the two statistics. The gap in the statistical position was reported at 49.4%, indicating a massive gap in the rate of employees having bank accounts. Differences in the rate of having and not having a bank account and saving are noticeable. However, it is worth mentioning that formal savings through banks and saving data of the RMG sector may not be hugely reflected in the national statistics. However, it is worth encouraging that RMG industrial workers have a positive attitude toward institutional deposits and savings.

12. Policy Contribution of Study

This study's findings on institutional or bank savings are likely to contribute to Bangladesh's socioeconomic condition, macroeconomic avenues, policy framing, and reforms, above all labour economics. Fiscal strength and gap of labour forces and the elevation of their financial capacity can be well-assessed.

We have found some relevant findings on the state of the social and economic conditions of the industry workforce. Against these findings, some policy suggestions for the Government are considered for improving the socio-economic condition of industrial workers.

- Most RMG workers belong to low-income groups. Since wage income is associated with various household assets and improved living conditions, the minimum wage needs to be raised to support employees' living standards.
- Introducing a living wage is another much-needed expectation of the RMG sector workforce. This living wage can ease further improvement of workers' socio-economic conditions. Our findings may provide a rationale for a living wage to offer decent living and income in urban areas.
- The saving position of RMG workers enhances national savings and investment to GDP. Small savings from marginal people have huge macroeconomic implications in the long run, enhancing the saving spree. Saving also heightens the motivation of workers, especially in women-dominated industries.
- Decent income and savings may secure improved living conditions and reduce government external borrowing from development agencies to meet the resource needs for the growing economic development needs. Better saving options encourage job security of employees to a large extent.
- Monetary policy can advise commercial banks to add higher incentives or interest for marginal savers' savings. Since Bangladesh Bank keeps

a provision to retain .03% of export proceeds for the welfare of labour, enforcement of this provision among the RMG sector employers will be facilitated.

- The socioeconomic condition of RMG workers, savings, and income availability reduce the government's social safety net budget. The government may allocate an extensive social safety net budget to ensure the social safety of low-income, distressed people and jobless workers. Savings can reduce government borrowing in the national budget.
- The Decent work concept by the ILO includes productive work, fair income, workplace safety, social protection, and decision-making for workers. The findings may ease the savings and income hikes of employees.
- The study's findings may lead to timely reforms in the existing labour rules regarding labour welfare, wages, and employee benefits, resulting in labour supply growth and improvement of labour economics.

13. Limitations of Study

Access was limited as visiting the factory during working hours was challenging. Understanding the purpose of this work, financial and saving needs behaviour, and challenges of industrial workers was a bit hard. Employees were found less keen to discuss financial and income matters as these are sometimes confidential to most of the respondents. Employers were reluctant to allow access to factories.

14. Brief findings, Conclusion and Recommendation for future research

The research has attempted to identify if the RMG workers have the capacity to save money after meeting all living expenses since they have inadequate earnings. In response to that, it is found primary challenges were low-income and growing cost of living standards crippling the scope of savings for meeting unforeseen needs and future demand from the relevant literature review. The demographic variables found that 68.7% of total employees are Unmarried, 19.3% are Married, and 12% are Divorced. 13.33% of employees were local descendants, whereas 86.67% were migrants. 30.6% of employees live in unimproved housing, and 70.3% live in improved housing.

However, the survey on core variables found that 98% of employees belong to the low-income bracket, while three belong to the high-income bracket. On the other hand, the Gender-based saving trend mentioned that about 106 employees save money using institutional options, including banks, where 87 are female and 19 are male, indicating female dominance in savings engagement. From the

housing condition context, a higher percentage of workers with improved housing prefer to save, around 74% or 77 more than unimproved houses, around 63.04%, equivalent to 29 employees. Regarding the gap in savings data, it was found that 79% of employees are saving in banks, contributing to the family and national savings. There is a considerable gap between the national savings statistics and savings by the country's largest industrial workforce. It was proven that the saving tendency looks higher among low-income working people in Bangladesh. In addition, migrant workers also save and deposit more than non-migrant workers. The smooth deposit can overcome existing socioeconomic challenges to a large extent. However, for the socioeconomic advancement of RMG workers, the correlation of income and savings with socioeconomic status may be studied. Economic variables, such as inflation, cost of living, and living wage, may be studied.

We believe that the low-income groups' standard minimum wage and saving pattern may be improved through policy reforms. The relationship between RMG workers' earnings and savings has been empirically tested. In addition, the upcoming economic change trend can discuss how the saving of RMG workers affects the national saving-to-GDP ratio. The decent work initiative considers the development of low-income group workers, which may be facilitated. Resource allocation in the national budget and mapping of a five-year plan may be effectively made, considering the study's findings for the industrial workers' best interests. With this growing saving attitude, industrial employees may save money for future needs and desired prosperity to some extent.

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Role of an NGO in the Poverty Reduction of the Char Dwellers in Kurigram District, Bangladesh

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Abstract

Kurigram is one of the riverside districts in the northwest region and is ranked as the highest in the poverty list among the poorest districts of Bangladesh. The study's objective is to find whether any involvement in the RDRS Bangladesh Program can help to reduce poverty among the char inhabitants in the study area. Using a multistage sampling design, primary data is collected from 160 respondents. This research is conducted using both qualitative and quantitative techniques. An econometric model, such as a multiple logistic regression model, is used to estimate the impact of socio-economic characteristics, including women's involvement in the RDRS program, on the possibility of poverty reduction. The result using the descriptive method shows that the respondents' socio-economic background is not overall sound in the area. The regression result shows that seven independent variables, including involvement in the RDRS program, age, education, average asset holding, and monthly average income level, would possibly negatively affect poverty incidence at a different level of significance. However, family size and occupation have a statistically positive and significant effect on the possibility of poverty for the respondent. This research would help identify the critical factors for reducing poverty so that appropriate courses of action can be taken to develop this backward region and sustain growing national development.

Keywords: Char dwellers · Microcredit · NGO · Poverty · Women

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1. Introduction

Over the years, Bangladesh has achieved considerable progress in reducing poverty and improving economic development. However, poverty is still prevalent in north-west Bangladesh. According to national data, the benefits of strong economic growth and the prevalence of poverty are not dispersed equally across the region. The national poverty rate has decreased by 8.3%, but the poverty incidence of the northwest district, Kurigram, has increased by 7.2% in 2017. According to the Bangladesh Bureau of Statistics (BBS)-2017, 70.87 percent of the population of this district is poor. In 2014, this figure was 63.67%. Four of the poorest ten districts in Bangladesh are located in the North-West Region (BBS, 2018). Kurigram has been ranked the highest (70.87%) in the poverty list in the country's districts.

Due to the location, many people in Dinajpur and Rangpur, Lalmonirhat, Kurigram, and Gaibandha face vulnerabilities like river floods, flash floods, waterlogging, soil erosion, and water scarcity (Rahman, 2007). Char inhabitants of the area are especially prone to extreme poverty and destruction due to their weak physical environment, little wealth, limited economic options, laziness, and lack of mainland institutions, as well as their varied livelihoods (Kamal, 2011). Research shows that boundary walls positively correlate with poverty and population vulnerability. The economics of char land is primarily based on agriculture, fishing, and livestock farming, making them vulnerable. Among the many causes of high poverty and vulnerabilities in the Char region, low fertility and high sandy land farming significantly impact their unemployment and weaknesses (Anderson, 1995).

The government makes many significant efforts for inclusive regional development and poverty reduction. However, the state faces many challenges overcoming income inequality and poverty in backward areas like the country's northwest region. NGOs are, therefore, indispensable for the planned development of these backward areas, including the char regions. Keeping these overall conditions in mind, NGOs are working together on poverty alleviation and livelihood programs, directly covering the poverty-stricken population in the poverty-prone region of northwest Bangladesh.

RDRS Bangladesh is one of the leading NGOs in the country. Since 1988, it has been working on the char population of the North-East region as an essential portion of its typical economic development program. It worked in more than 100 chars, ended extreme poverty, and reduced the people's livelihood vulnerabilities. It offers detailed development assistance, comprising microfinance, to the needy, particularly women, in 10 districts in Bangladesh's North-West and North-East areas. RDRS' Char Development Program (CDP) aims to increase access to essential services for all people, reducing vulnerability to natural disasters and social, political, and economic isolation. In particular, CDP actions include

children's education, primary health care, legal support to women, income generation, skills training and savings and loan services, training of adolescents, and agricultural extension (www.rdrsbangla.net).

Since 2005, the RDRS has worked with 2 million people from the lowest-income groups in the Kurigram district as a partner of different national and international agencies (www.rdrsbangla.net). The statistics show that the people of the Char area (Sandbar area) in the district are the worst sufferers, and they have lived below the poverty line for ages. Different NGOs, including RDRS Bangladesh, have moved onto the Chars to improve living standards and reduce poverty among Char dwellers. After considering the facts above, the study sought whether the RDRS involvement of charwomen can reduce their extreme poverty and vulnerability in the Kurigram district.

1.1 Objective of the Study

The main research question in this study is: "Is there any role of RDRS Bangladesh in eradicating poverty among char dwellers in the study area?"

The following specific objectives will fulfil the primary research objective:

- i. To discuss the socio-economic profile of the respondent's family.
- ii. To discover the major perceived factors causing their poverty and vulnerabilities.
- iii. To assess whether involvement in the RDRS program helps reduce extreme poverty among the char dwellers in the study area.

2. Literature Review

Considerable studies have been done on the role of NGOs and the poverty of char residents. Some studies find it fruitful to be involved in NGOs, and some studies find it harmful.

Bangladesh is a country of delta basins in the flood plains of three great rivers. Brahmaputra-Jamuna, Padma and Meghna (Sarkar, et al., 2003). An estimated 6.5 million people live in 28 sub-districts of five districts, such as Kurigram, Jamalpur, Gaibandha, Bogra, and Sirajganj, and 2 million people live in Chars are extremely poor (www.clp-bangladesh.org).

Academics and researchers interested in human livelihood and socio-cultural perspectives primarily conduct Char land research in Bangladesh. The first was Adnan's (1976) study of power dynamics in a remote community in the Barisal region, a char land area. Currey's (1979) work in the Rangpur district was also recorded. The study's main goal was to investigate survival techniques during food scarcity.

Baqee (1998) conducted significant research, recognising the Char area as Allah Janne's land (God Knows). The study describes the vulnerability of the

people who live in Bangladesh's char lands. Using case studies, the paper focuses on the survival methods of people on the char land in the face of environmental and social crises.

Many studies focused on poverty status and the associated factors that cause poverty. Rahman (2007) conducted a study on 14 chars in the Jamuna basin in the northern portion of the country, which revealed that poverty status had changed significantly more than division, district, and char areas. A considerable part of the people (78%) was poor, and there was a noticeable difference between the mainland and the char land. Char dwellers' yearly per capita income was substantially lower than the national average, at BDT 14,955 (Barua, 2007; BBS, 2007). According to Barua and Sulaiman (2007), the poverty rate on char land is 1.5 times higher than in the mainland.

Char lands are unstable and prone to annual flooding. The char residents are the poorest and most vulnerable (Cameron & Trivedi, 1998). To cite the major reasons for their Poverty, Rahman (2007) concludes that char residents are marginalised by mainlanders' benefits for their primary communication networks in addition to the major physical risks associated with rivers. Kamal (2011) found that disaster incidents that increase their vulnerability affect everyday livelihoods in the chars.

Sarker et al. (2020) used the Resilience Index Measurement and Analysis (RIMA) methodology to investigate the livelihood resilience of vulnerable char dwellers. They discovered that char dwellers had a low level of stability, making them vulnerable to the effects of natural calamities. On the other hand, residents of char areas close to the mainland showed a higher (0.353) level of resilience than those in remote char areas (0.347). They also advised that a capacity-building initiative, including local government, NGOs, and public-private collaborations, is vital to improving the resilience of char dwellers across Bangladesh.

Most previous studies have concentrated on the role of NGOs in poverty reduction and the improvement of the standard of living. Uddin (2000) assessed the effects of the Grameen Bank microcredit program on rural female borrowers in a particular area of the Mymensingh district. It was discovered that after enrolling in the GB credit scheme, the members' living standards improved.

Chowdhury et al. (2005) empirically explored the role of microcredit in alleviating Poverty in Bangladesh. The primary findings were that microcredit was linked to lower objective and subjective poverty and that its effect on poverty was exceptionally high for around six years, with some levelling off after that.

Hashemi et al. (1996) analysed two Grameen Bank and BRAC programs that supplied credit to disadvantaged rural women in Bangladesh to alleviate poverty. They discovered significant results in decreasing poverty among rural women's households.

Several kinds of research have discovered that it has a good effect on living standards. Microfinance programs, for example, can be an efficient approach to delivering low-cost financial services to disadvantaged families and individuals (Miller & Martinez, 2006; Stephens & Tazi, 2006). Some studies, such as those by Hossain (1984), Hossain (1988), and Khandker and Chowdhury (1996), have directly assessed the impact of microcredit on poverty.

However, other research has indicated that microcredit does not reduce poverty. Due to the extra load of debt, poor households become even poorer. Microfinance programs, for example, have been proven in some studies to aid the moderately poor more than the impoverished, and their effect varies by income level (Copestake et al., 2001; Morduch, 1998; Dugger, 2004).

Regarding the failure of the work set by the NGO for the char people, Sultana and Islam (2017) found that even if intervention in the standard of living of NGOs somehow enhances their socio-economic status to such an extent that it can enable them to come out of the vicious cycle of poverty, the manoeuvre of a natural disaster or challenges can subside their bright future soon.

Haque et al. (2017) investigated whether and to what level the Char Livelihood Program (CLP) affects the residents of Sirajganj Char's livelihood and income-generating activities. The DFID of the United Kingdom (UK) implemented the program. They discovered that char dwellers on the islands are generally marginalised in comparison to their mainland counterparts in terms of physical isolation and vulnerability to flooding and erosion, which has resulted in seasonal migration and a greater reliance on traditional money lenders for credit supply, trapping them in a vicious cycle of debt and poverty. Their research also reveals that char dwellers' access to land resources has established legal possession and ownership of land.

Although a wealth of research papers on the role of NGOs in the development of char people from a national and international perspective are available, studies on NGO interventions for reducing extreme poverty with a particular geographic concentration are scarce. No empirical study has been done about the role of NGOs, especially for the people of Char lands in the Kurigram district. This study attempts to fill this research gap.

The hypothesis of the study

The research hypothesis is advanced based on the literature framework:

Null Hypothesis (Ho): An involvement in an RDRS program will possibly help reduce extreme poverty among the char dwellers.

Alternative Hypothesis (H₁): An involvement in the RDRS program will not help reduce extreme poverty among the char dwellers.

3. Methodology of the Study

3.1 Data collection and the study area

In the northwest region, Kurigram is the largest poverty-ridden district with many rivers and char dwellers. RDRS Bangladesh has been working to reduce extreme poverty and livelihood vulnerability in the charred area of Kurigram. Therefore, this district is selected for our study.

The study population consisted of female char dwellings in the area who had been beneficiaries of RDRS initiatives for at least one year. This research is conducted using both qualitative and quantitative methodologies. This study is based on both primary and secondary sources of information. Secondary data will be gathered from the Bangladesh Bureau of Statistics (BBS) for different years, RDRS, other agencies, and daily newspapers.

3.2 Sampling Process

A multistage sampling design is followed to collect primary data. In the first stage, among 9 Upazilas in the district, 2 Upazilas, namely Chilmari and Char Rajibpur, the highest char-dominated areas, are purposively selected based on the severity of poverty incidence that were identified through a review of upazila-wise poverty in the HIES survey-2016. In the second stage, two unions of the determined Upazilas are selected by simple random sampling. In the final stage, four villages are selected by simple random sampling from the selected unions. Finally, 160 women who directly or indirectly benefitted from the RDRS program were interviewed from various extreme poverty-concentrated areas of selected villages.

3.3 Analytical Framework

In this study, tabulated techniques are used through univariate and bivariate analysis to explain the overall socio-economic characteristics of the char residents in the study area. The collected data are scrutinised and summarised using statistical packages for the social sciences (SPSS) and Microsoft Excel-2010. An econometric model, such as a multiple logistic regression model, predicts whether women's participation in RDRS Bangladesh can significantly reduce extreme poverty. Poverty is the percentage of households with 'per capita household income' below or equal to the poverty line. Here, poverty means the lack of a minimum per capita household income ("1.90-day") of the respondent family. The World Bank defined "extreme poverty" as the percentage of people living on or below \$1.90 per day. In this study, the "\$1.90-a-day" international poverty line is

calculated and adjusted into Bangladeshi Taka using the country's PPP Conversion Factor published by the World Bank (Rahman & Islam, 2016). The poverty line in 2021 was the equivalent of BDT 1983 in a month. However, at the end of 2022, the international poverty line will be updated from \$1.90 to \$2.15 per person daily, equivalent to 2245 BDT/month in 2022.

3.4 Quantitative Analysis Section: Econometric Model

The following logistic regression model is estimated to estimate the factors determining the possibility of extreme poverty among char people who are beneficiaries of the RDRS program.

$$POV = \beta_0 + \beta_1 AGE + \beta_2 OCCPTN + \beta_3 EDU + \beta_4 RDRS + \beta_5 F_SIZE + \beta_6 ASSET + \beta_7 INCOME + \varepsilon_i$$

Where:

POV = Poverty Incidence (**Dependent variable**)

(1=Poorest, 0= Otherwise)

Independent variables:

AGE= Age of the respondent in years

OCCPTN = Respondent's Occupation. (1= Salaried Job, 2= Business, 3= Farming, 4= Otherwise)

EDU= Year of schooling of the respondents

RDRS= Dummy variable (1= Beneficiary from any program of RDRS, 2= otherwise)

HH_SIZE = Family size of the respondents

ASSET= Amount of asset holding of the family in taka.

INCOME= Per capita income of the respondent family in a month.

ε_i = Disturbance term

$\beta_0, \beta_1, \dots, \beta_6$ are known as the parameters of the model or intercept and slope coefficients, respectively.

The study assumes that the probability of reduced poverty depends on these independent variables related to individual and household socio-economic characteristics. We have included these significant variables based on the literature review. According to theory and literature, our hypotheses are as follows: Age(X_1), Occupation(X_2), Education(X_3), RDRS involvement(X_4), family size (X_5), Average asset-holding family (X_6), and Average monthly income of the respondent (X_7) have a significant impact on poverty of the respondent in the study area.

4. Result and Discussion

4.1 Analysis of Descriptive Statistics

4.1.1 Socio-demographic Profile of the Respondents

Socio-economic characteristics play a catalytic role in affecting women's poverty through their participation in income-generating activities with the help of NGOs. Table 1 shows the age composition of the respondents. The age of the char dwellers is one of the essential aspects in establishing their personality makeup, which may play a critical influence in their poverty reduction.

Table 1-Socio-Demographic Profile of Women in Char area

| Characteristics/ variables | Categories | Frequency (N=160) | Percentage |
|-------------------------------|-----------------|----------------------|------------|
| Age range | Less than 20 | 8 | 5 |
| | 20-29 | 42 | 26.25 |
| | 30-39 | 63 | 39.375 |
| | 40-49 | 28 | 17.5 |
| | 50 to above | 19 | 11.875 |
| Occupation | Salaried Job | 21 | 13.12 |
| | Business | 25 | 16.5 |
| | Farming | 36 | 22.5 |
| | Otherwise | 78 | 48.75 |
| Household size | 1-3 persons | 48 | 30 |
| | 4-6 persons | 102 | 63.75 |
| | Above 6 persons | 10 | 6.25 |
| Education level | Illiterate | 63 | 39.375 |
| | Literate | 19 | 11.875 |

Source: Field Survey-2019

Table 1 shows that the bulk of the respondents (39.4 %) are between the ages of 30 and 39. Only 5% of respondents lie below 20, while about 26, 17.5, and 12% are 20-29, 40-49, and 50 to above age, respectively. Findings in Table 1 reveal that 20—to 39-year-old women comprise the majority of the charwomen, 65% of the total.

Regarding occupation, it shows that a significant (48.75%) proportion of respondents are either engaged in informal jobs or homemakers. About 22.5% of respondents are engaged in farming jobs, and the rest, 13.12% and 16.5% are

involved in salaried jobs and businesses, respectively.

Table 1 also demonstrates that about 64% of respondents belong to a family of 4-6 persons, whereas 30 % and 6 % have a family size of 1-3 and above six members, respectively.

Individual education aids decision-making, problem-solving, and developing a positive attitude toward income-generating activities. As a result, literate individuals can play a critical role in reducing poverty at the family level. Thus, the level of education induces poverty reduction among women. It is seen from Table 1 that 39.37% of respondents are illiterate or have the inability to sign. About 12% of respondents are literate but did not complete their primary education, whereas about 22% and 16% completed primary and Secondary School education. About 7% of respondents have HSC, and 5% have a degree or more than a degree-level education. It is clear from the table that most (87.5%) of the respondents are not their family heads.

4.1.2 Average earning, borrowing, and saving of the respondent family

Table 2 reveals that their average monthly income level is very low. Char dwellers are hard workers and largely participate in various income-generating activities but have relatively lower monthly income due to individual and external factors like uncertain flood erosion, natural disasters, geographical challenges, and some internal factors, including lack of education, engagement in informal jobs, etc. It is noted from the table that about 43% of respondents get below 1000 Tk/month, and 32.5 % of respondents get 1001–2000 Tk/month, while 11.25 %, 3% and 2.5% of respondents get 2001–3000 Tk in month, 30001-4000 Tk/month and 4001-5000 taka/month respectively. The rest, 7.5 % of the respondent's family income, is above 5000 Taka in a month.

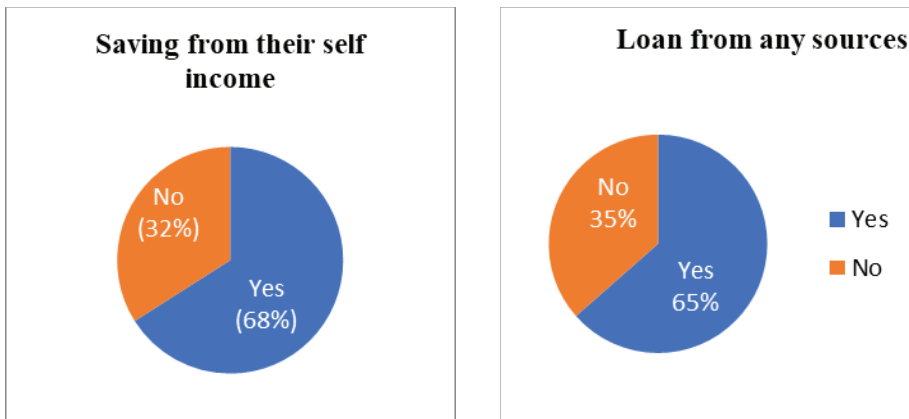
Table 2: Average monthly income of the respondent

| Categories | Frequency(N=160) | Percentage |
|------------|------------------|------------|
| 0-1000 | 69 | 43.13 |
| 1001-2000 | 52 | 32.5 |
| 2001-3000 | 18 | 11.25 |
| 3001-4000 | 5 | 3.13 |
| 4001-5000 | 4 | 2.5 |
| Above 5000 | 12 | 7.5 |

Source: Field Survey 2019

Figure 1 reveals that the majority (68%) of the respondents have a saving tendency, but at the same time, most of them (65%) have loan-taking behaviour from the neighbouring NGO or other sources. They save or borrow through different non-formal samity or local NGOs. Some of them deposit their savings to and borrow from the banking sector, but very few respondents get an opportunity from the banking sector.

Figure 1: Saving and loan behaviour of the respondent

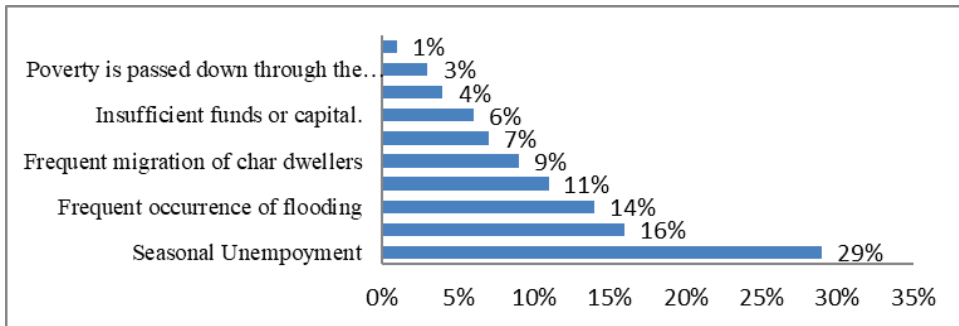


Source: Field Survey-2019

4.1.3 Reasons for Poverty and vulnerabilities of the respondent family

Poverty and vulnerability among char dwellers are not separate issues; they are intertwined with various social, economic, and personal concerns. The research reveals some factors contributing to their poverty (which are not mutually exclusive). According to survey findings, the major causes of their poverty are-, Insufficient land for cultivation due to sandy soil, Frequent occurrence of flooding, seasonal unemployment, Char area's riverbank erosion, Frequent migration of char dwellers, Frequent Natural disasters (drought, cyclone), Insufficient funds or capital, poverty is passed down through the generations, Insufficient education facilities, and Inadequate training facilities which are described with a percentage in figure-2. The figure shows that most (29%) respondents are poor and unemployed at regular intervals during the specific season.

Figure 2: Major Causes of Poverty perceived by respondents



Source: Field Survey-2019

4.2 Quantitative Analysis

4.2.1 Interpretation of Regression Result

Table 3 briefly discusses the result of the estimated logistic regression model for the respondent family’s poverty. Multiple logistic models are estimated to test the research hypothesis regarding the relationship between the likelihood of the respondent’s involvement in the RDRS program as a beneficiary and the change in extreme poverty of respondents.

Table 3: Regression Results of Logistic Model for Poverty

| Variables | Odds Ratio | Standard Error | Wald |
|---|------------|----------------|--------|
| (Constant) | 2.525 | 0.718 | 12.368 |
| X_1 (Age Level) | -0.302** | 0.128 | 5.567 |
| X_2 (Occupation) | 0.253** | 0.112 | 5.103 |
| X_3 (Education) | -0.303* | 0.161 | 3.538 |
| X_4 (RDRS) | -0.283* | 0.142 | 3.980 |
| X_5 (Family Size) | 0.176* | 0.096 | 3.358 |
| X_6 (Asset holding) | -0.285** | 0.122 | 5.486 |
| X_7 (Income of the respondent family per month) | -0.375** | 0.165 | 5.169 |

Note: Dependent Variable: Poverty, Sample Size N=160 Nagelkerke $R^2 = 0.69$

***, **, * indicate significant at 1%,5%, and 10% level respectively

Source: Authors’ own calculation based on Field Survey-2019

The estimated result shows that variables like Age (X_1), Education (X_3), Average monthly income of the respondent (X_7), Asset holding (X_6), and RDRS intervention (X_4) have a statistically negative significant impact, but family size (X_5) and occupation (X_2) have a statistically positively significant effect on the possibility of poverty of the respondent at various levels of significance ($\alpha=1\%, 5\% \& 10\%$).

According to the regression result, the log odd of poverty is negatively related to the age of the women at a 5% level of significance. This indicates that the older the woman, the more likely to contribute to the family income and reduce poverty. A one-unit increase in women's age decreases the likelihood of women's poverty by 0.302, with other things remaining constant. Table 3 shows that poverty is positively associated with occupation and family size at 5% and 10% significance levels, respectively. Accordingly, any occupational change from a salaried job to an unpaid job increases the likelihood of poor by 0.253, keeping the other variables constant.

Similarly, the larger the family size, the greater the likelihood of poverty. Regarding the effect of education, it is found that the log odds of women's poverty decrease by 0.303 as the respondents are more educated. Other things remain constant. This indicates that education is essential for the reduction of poverty among respondents. Women who are RDRS program beneficiaries have an almost 0.283 times higher probability of reducing poverty, while other things remain constant. The result shows that the change significantly negatively influences the log odds of poverty in the average asset value of the family and average per month income with 5% statistical significance, respectively. The log odds of the likelihood of women's poverty decreases by 0.285 as the average asset value of the respondent increases, and the probability of poverty decreases by 0.375 when the respondent's income rises; other things remain constant.

5. Summary and Conclusion

The paper has attempted to assess the socio-economic profile of the beneficiary women of the RDRS program. It also explores the role of an NGO in extreme poverty reduction and finds out the perceived reasons for the extreme poverty of char residents. The descriptive result shows that the respondents' socio-economic background is not overall sound in the study area. Most female respondents (39.4%) are in the 30–39 age group. Education status among respondents is worse on average.

The paper found that most women work hard daily, but their monthly average income is minimal. More than 43% of the respondents earn less than 1000 Tk monthly. Most respondents (68%) tend to save, but at the same time, most (65%) have loans dealing with neighbouring NGOs. The paper also explores the major reasons

for their extreme poverty level. Two main reasons are seasonal unemployment and insufficient land for cultivation due to sandy soil. The regression results of the logistic model suggest that all socio-economic characteristics, including age, occupation, education, asset value, RDRS interventions, family size, and income level per month, likely significantly affect women's poverty in the study area. More importantly, for the women involved in the RDRS program, the probability of poverty reduction is higher for their families.

This research will help identify the root causes of poverty and livelihood weaknesses in the region. Thus, appropriate courses of action can be taken to develop this backward region and sustain growing national development. About the obtained result, there are many recommendations to eradicate extreme poverty in the Kurigram Char region. The most important suggestions are-

- i. Appropriate and more initiatives would be taken to increase the number of schooling years for women in the Char area.
- ii. Ensure the physical structure for education service so that local people are encouraged to stay connected, adjust to seasonal disruptions, and continue communication for their development.
- iii. The government or NGO should form volunteer groups to help adjust to break studies during the disaster and revitalise the char. Also, the satellite program can help develop higher studies among Char people.
- iv. The government and NGOs should generate more formal or salaried jobs to accelerate poverty reduction among women in the charred area.
- v. Large-scale credit facilities / financial assistance from the government and NGOs are essential for poverty reduction.

There are also some weaknesses to this study. Firstly, while analysing poverty, the study considered a sample size of 160 out of many existing respondents. Secondly, the study only assumed the average income of the respondent family to determine their poverty level. Thirdly, the study excluded the income of those working and contributing informally to the family income. Fourthly, measuring the actual poverty level, magnitude, and change over time in the study area was impossible. Finally, the study could review both socio-economic background changes over time and their poverty dynamics, but it is excluded in this report due to inadequate time. However, in our opinion, this paper has a significant impact and might allow policymakers to prescribe proper initiatives for reducing extreme poverty in the charred area of Bangladesh.

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Paradoxical Social Changes in Bangladesh

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Abstract

This paper explores and interprets that Bangladesh has made unprecedented progress in raising its per capita income and gross domestic product (GDP) over almost half a century. However, the nature of the overall social change this country has experienced seems more paradoxical in that a mere increase in per capita income, GDP, and basic infrastructure does not constitute development itself. Instead, development and social change imply more holistic positive changes in the socio-economic structure, social norms and values, political system, cultural milieu, and natural environment. Growth-oriented social changes have been accompanied by unbridgeable socio-economic inequality between different social classes and strata. Economic governance is increasingly marred by predatory practices in the banking sector, crisis-ridden stock markets, and money laundering. While recent economic changes have brought about a boom for the professional sections and comprador business classes, overall, the agricultural sector and farmers have experienced a bust in their socio-economic status. Our political system lacks sound governance since all state institutions are increasingly becoming corruption-ridden and dysfunctional. Unprecedented lawlessness, food adulteration, intolerable environmental pollution, and the resurgence in religious orthodoxy pandered by the ruling party have darkened its shiny side of socio-cultural progress in terms of modernity. On top of that, prioritising quality education, public health, and well-being has become a nightmare compromised incrementally by deficit financing and unscrupulous management systems. Given this backdrop, this paper has sought to offer several policy suggestions to put Bangladesh on its trajectory towards development.

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Keywords: Growth • Development • Governance • Inequality • Social Change
• Paradox

Introduction

Over the last three decades, Bangladesh has achieved major macro-social changes in increasing its per capita income and overall Gross National Product (GDP). These macro-social changes have affected major socio-economic changes, improving its image as one of the ‘development’ successes among the Least Developed Countries (LDCs) of the United Nations. As a result, it is no longer regarded as ‘a basket case for foreign aid’. It is no longer known ‘as a poster child of poverty.’ Instead, different quarters, especially the international development community consisting of different officials associated with various development agencies such as the International Monetary Fund (IMF) and the World Bank, various personnel involved in development-oriented Non-Government Organizations (NGOs) have been hailing Bangladesh as a model for development. This community also suggests that other developing countries can adopt Bangladesh as a model for their development activities. The current Government in Bangladesh and the ruling party leave no stone unturned to exaggerate the achievements and the resultant image of Bangladesh.

What is distinguishing here is that even the epistemic community of economists who deal with growth, development, and poverty alleviation have also recently joined the chorus, singing aloud about the achievements of Bangladesh (Mushtaque, 2007). Even some economists have sought to project this economic and social progress of Bangladesh as a “development surprise” They further suggest that Bangladesh could be a “development model” for other developing countries (Barai, 2020). Contrary to mainstream economists, the authors of Bangladesh in the Asian Century argue that macroeconomic drivers in the form of good governance have led to sustained economic growth in Bangladesh. Mujeri and Mujeri (2021) argued that Bangladesh is one of the most interesting cases in studying present-day development combined with its rapid growth and catching up. They highlight the development traps Bangladesh encountered during its journey and the ones it may face in the coming decades to make progress and attain prosperity (Mujeri & Mujeri, 2021). Miracles and challenges have also made a bold claim that Bangladesh is a development “miracle” because it has achieved much under unfavourable conditions while suggesting that other developing countries can adopt policy interventions that have worked in Bangladesh (Sawada et al., 2018).

Although the increasing number of young people appears to offer a dramatic horizon of new opportunities, Bangladesh has not been able to take advantage of

the population dividend. Instead, greater sections of society have been willy-nilly kept outside development activities through neo-liberal jobless growth. One of the main reasons is that the country has yet to adequately finance education, health, skill development training, and opportunities targeted at young adults. Therefore, an increasing number of people tend to seek overseas employment for worthwhile jobs and better lives. However, the migration pattern of Bangladesh seems entirely predictable, with low-skilled labour resulting in lower remittance (Wadood et al., 2022). In fact, with prioritised policies and programs, the burgeoning youth section of people in Bangladesh could be used to achieve great potential inside or outside the country. Our national political system is lacking both sound governance and a sustainable future. Almost all state institutions are increasingly becoming corruption-ridden and dysfunctional. The transport sector has undoubtedly experienced unprecedented infrastructural developments, but lawlessness has darkened its shiny side. The education sector has recently experienced a revolution in quantity, but its quality is questionable. Socio-cultural progress in terms of modernity has been dimmed by the resurgence in religious orthodoxy pandered by the ruling party. Gains in the health sector have been compromised by the poisonous food culture and mismanagement exacerbated by unscrupulous doctors and other personnel. Socio-economic prosperity has been accompanied by intolerable environmental pollution, unsustainable population growth, the slow death of the existing river system, and global climate change. This paradoxical social change will likely hamper Bangladesh's future tempo of development. In this light, this paper aims to make several pragmatic policy suggestions for Bangladesh to uphold its genuine spirit of development.

This paper is divided into two parts. Part I seeks to deal with and interpret a variety of issue areas in which Bangladesh has been making progress while simultaneously experiencing paradoxes of one kind or another. On the other hand, Part II offers a wide array of policy suggestions that Bangladesh can adopt and thus overcome many bottlenecks in its future development trajectory. It is followed by a short conclusion that seeks to capture the normative essence of the paper. Methodologically speaking, this paper mostly depends on qualitative data, though quantitative data have also been used to explain and interpret various issues dealt with in this paper. Since it is primarily an interpretive paper, quantitative data have been amply used in this paper to develop an understanding of the development paradigm of Bangladesh and its resultant paradox.

Part I: Growth, Progress, and Paradox

We have made progress in per capita income, poverty alleviation, the standard of living, infrastructural development, literacy rate, and overall human capital

development over the last fifty years following our independence in 1971 (Malek et al., 2022). However, our development is not as rosy as we see because these neo-classical economists still measure development only in terms of per capita income and gross domestic product (GDP). However, a mere increase in per capita income, GDP, and essential infrastructure development does not constitute development *per se*. Instead, development and social change imply more holistic positive changes in the socio-economic structure, social norms and values, political system, cultural milieu, and natural environment.

It merits our attention here that the hegemony of neo-classical economics has been subject to criticisms from several schools of economics (William & McNeill, 2005). Similarly, our fascination for growth and GDP has also been criticised (Pilling, 2018). Nevertheless, economists still belonging to the neo-classical school of thought cling to per capita income and GDP while measuring development. Taking per capita income as the basic denominator of development, one can argue that the USA is more developed than Sweden because the former has higher per capita income than Sweden (World Bank 2020). However, in real life, Sweden is more advanced than the USA because Sweden still has a good social welfare development despite substantial dents inflicted on this once-vaunted Scandinavian model made by the neo-liberal hegemony over the last thirty-five years (World Bank 2020).

Moreover, development thinkers of the Neo-classical School seek to project the current development of Bangladesh as a ‘success’ story. However, if we assess this development paradigm from many indicators of development associated with the Human Development Index (HDI) and other schools of development, we get a different picture of the current socio-economic reality of Bangladesh (Azad, 2015). Anyway, the cumulative development that Bangladesh has experienced over the last two decades is questionable from the standpoints of various socio-economic indicators of development.

Governance is one of the crucial factors both in ensuring and sustaining economic development among developing countries. Khan (2013) stated that governance is one of the critical factors ensuring different levels of performance among developing countries. Nevertheless, prominent development thinkers have not yet reached any consensus on which governance model is more effective in ensuring development (Fortunato, 2015). Anyway, Democracy, Sen (1999) argues, has been preferred as a universal value by the vast majority of people for its intrinsic importance in ensuring political participation and freedom in human life. Sen (1999) also emphasises the constructive role of democratic governance in forming human values and understanding needs, rights, and duties. Besides, most economists prioritise democratic government as more effective in ensuring and sustaining development.

Bangladesh has been seriously lacking democratic governance and institutional building. No doubt, we started a democratic journey in 1991 after having overthrown a military dictator in 1991, but we have deviated from that democratic trajectory over time. In the forward book *Bangladesh at 50: Development and Challenge*, Sobhan (2020), the doyen of economists in Bangladesh, has sought to capture the reality of the democratic deficit in Bangladesh more poignantly. According to him, Bangladesh has experienced remarkable economic growth but is underperforming in the governance sector. It is also a significant challenge for the trajectory of growth and progress in Bangladesh (Sobhan, 2020). The crisis in governance has been profoundly affecting the prospects of democratic government in the sense that the possibility of holding a peaceful election, which is a pre-condition for the transition of power, is increasingly becoming controversial. Other democratic institutions, cultures, and norms are also in crisis. The freedom of the press is not up to the mark in our national life. The rule of law as a principle of democracy stands compromised because semi-anarchy prevails in parts of the country where the mighty call shoots in public life, and the weak and poor are often the victims of their wrath and aggrandisements. Foreign governments are taking advantage of such a crisis in democratic governance and increasingly interfering in our national politics.

The high rate of economic growth and rampant corruption, which characterised Bangladesh's development scenario for the last few decades, may establish positive correlations between them. Still, in the final analysis, it becomes vividly clear that corruption and economic growth are negatively correlated in Bangladesh. Corruption is rampant in national life because it has permeated all aspects of society. Financial sectors, especially the banking sector and share market, are hostage to the greed of the affluent class, who are prone to loot these institutions and launder their loot abroad. The state has a vital role as a regulator in a capitalist economy like ours, but the state mechanism has proved deficient in regulating several sectors such as banking, finance, insurance, industry, environment, health, education, manpower export, and transportation. Bangladesh has made considerable investments in public infrastructures, which are expected to have an enabling role in accelerating development. However, the quality of these projects is being increasingly questioned due to delayed construction and cost overruns. Corruption deprives people of their rights and erodes their faith in the government. Monwarul Islam rightly points out (Islam, 2021):

“What corruption does is, however, far more fundamental. It erodes people's rights to services. It negates people's rights to the quality of life that they are promised by the government and to benefits that public agencies and legal institutions are entrusted with to ensure. Corruption, to put it in a nutshell,

gnaws at people's lives, making them suffer in ways that economic discourses and economic growth indicators leave largely unattended. For example, people in Bangladesh, as in other corruption-ridden countries, routinely find it difficult to have unhindered access to legitimate services from the law enforcement agencies, road transport authorities, courts, land records and settlement offices, educational institutions, hospitals and other service sectors. Studies show that at least 68 per cent of the rural and 65 per cent of the urban people experience bribery while they seek services from public agencies and institutions. Such a widespread culture of bribery undermines people's legitimate rights to services for which they pay taxes."

The neoliberal economic order that most of the countries have been practising over the last three decades has no doubt accelerated the rate of economic growth, but it has almost created unbridgeable income inequality between the few rich at the top and the overwhelming majority at the grassroots level. Stiglitz (2012) has pointed out that society has become unfair due to the working of the neoliberal economic order, which has created a widening gap between a small, rich class and a broader section of the poor (Stiglitz, 2012). Piketty (2017) has also highlighted more profoundly the inequality that has been increasing between the owners of rentier capital, who constitute no more than one percent of the population, and the overwhelming majority, who are almost ninety-nine percent of the people.

From the standpoint of inequality, Bangladesh society is an appropriate example because income inequality is rampant in Bangladesh more than in many other countries. And this is the product of the unequal neoliberal economy. To be sure, inequality in Bangladesh has been widening so fast that only 10% of the people at the top are gaining at the cost of 40% of the mass people. Resources are concentrated in the hands of a few rich people, and a large section of the people are becoming deprived and thus peripheral in national life (Titumir, 2021). Like the economists of the World Bank, neo-classical economists seek to hide class as a criterion in socio-economic analysis in Bangladesh. Accordingly, they ignore the growing inequality between different people in Bangladesh. Still, one should not make both class and inequality invisible because this overarching inequality aggravates class differences in the country and disturbs socio-economic equilibrium among different categories of people. The bane of growing inequality is pernicious because the more the middle and lower classes experience inequality, the more they lose purchasing power, with its deleterious effect on the country's overall economic well-being. Covid-19 has further aggravated the already unequal relationships among different classes of people because this pandemic has added more than 20 million people to the growing army of poor living below the poverty line.

Our national budget has been becoming bigger in size and more ambitious in goals because we have been relatively successful in mobilising vast amounts of internal resources over the last three decades. As a result, our dependence on foreign aid has decreased to a greater extent. Nevertheless, our internal revenue generation in the tax-GDP ratio is weak. Foreign direct investment (FDI) is indispensable for accelerating the economic growth rate in Bangladesh's economy. The high economic growth that Bangladesh has been achieving for the last three decades should have been a sufficient factor for attracting a higher level of FDI. However, Bangladesh has been experiencing a paradox because "bureaucratic issues, infrastructure shortfalls, high tax rates, and difficulty in accessing finances are" (Shariar, 2022) impeding the flow of FDI in Bangladesh.

Bangladesh, a garments exporting country, has become the second biggest exporter of garments producer after the People's Republic of China. However, unprecedented growth in the garments industry has increasingly been undermined by a series of accidents, the lack of skill development and diversification, and the rampant exploitation and deprivation of workers. Overwhelming dependence on a single sector, such as garments, also does not bode well for the country in the long run. We can improve the quality of our garments industry by persuading the owners to introduce skill training for workers, diversify their products and ensure workers' rights. The state can also diversify and develop a multi-sectoral economy by paying importance to pharmaceuticals, light engineering, and agro-based industries. However, concerted efforts to further develop these sectors are still lacking. Much heralded digital economy and the computer industry have made headway, but these sectors have not witnessed any optimum level of growth.

The agricultural sector has made progress in reaching national self-sufficiency in food production, but farmers have not been able to share this prosperity. High labour and input costs, slow distribution of credits among farmers, the dominance of both middlemen's chains, and the formation of cartels in agricultural sectors have stopped the progress of the farmers and diversification of agriculture (Azad, 2021). Agriculture has made progress, but overuse of fertilisers has a detrimental impact on the quality of the land, reducing its fertility and growing crops with a negative impact on human health and the environment (Azad, 2021; Titumir, 2021). Hunger almost disappeared in twenty-first-century Bangladesh since our development enabled us to conquer this age-old social menace. However, we still have problems with nutrition, which results in the stunting of children. However, hunger is again returning due to the recent crisis caused by the Russo-Ukraine war. A UN study has revealed that 87% of people find it hard to eat three times a day (Prothom Alo, 2022).

The job creation record in the national economy is not encouraging since we have jobless growth (Titumir, 2021). The number of unemployed graduates, especially unemployed graduates, is increasing in the country. However, much more disappointing has been the meagre job prospects for those still preparing for employment in the future. As a result, our disillusioned young generation is easily falling victim to the misguided religious sermons of unscrupulous religious scholars. As a palliative, they are turning to extremism and violence by joining the so-called jihadi organisations and fuelling Islamic resurgence (Khan, 2013). Since our cultural space is getting narrower and narrower due to the ever-increasing closing of our minds, another group of young people is turning to computer games, drug addiction, and pornography for instant gratification. It should be mentioned here that nationalist and progressive forces are responsible for the poverty of our cultural life because they lack imagination, innovation, and creativity in this epoch distorted by the receding legacy of neoliberalism.

A wide range of informal indicators of development, such as quality of public transport, chaotic traffic system, lack of quality tap water, and non-availability of public amenities such as public libraries, museums, zoos, and pedestrians' roads, are also telling upon the quality of national life all over the country. We have experienced unprecedented growth in the number of educational institutions and enrolments of students at every level, from the tertiary to the primary. However, quality education is still a far cry in national life. Many factors, such as non-implementation of national education policy, lack of efficient and motivated teachers, who have mainly been recruited through corrupt practices and local pressure, high dropout rates at the primary and middle schools, state failure in ensuring vocational education, outdated Madrassa education, lack of emphasis on science education and scientific culture, and low rate of government investment in the education sector are responsible for this dismal picture in education. The lack of national consensus on national education policy and curricula is also accountable for this poor state of our education. The government further complicates the education sector because it does not spend what it promises. Expenditure on education as a percentage of GDP and the total budget outlay rank Bangladesh at the bottom among South Asian countries. Even Nepal is ahead of Bangladesh (Billah, 2022).

The health sector has experienced tremendous growth in institutional expansion, but the lack of a motivated workforce, corruption, and mismanagement have compromised its efficacy. Concerning the national investment rate in the health sector, it spent much less than many South Asian countries, such as Nepal and Pakistan, and only about half of India (Azad, 2015). Environmental pollution and excessive chemicals in foodstuffs are affecting our overall health. The global climate crisis has already made Bangladesh one of the most vulnerable countries

in the world. Undoubtedly, the World Air Quality Report 2020 finds Bangladesh the most polluted country. As a result, we are increasingly breathing contaminated air. Bangladesh has become among the twenty unhealthiest countries globally (Noorane, 2021). In addition, Bangladesh's ecological crisis has been further aggravated by politicians and accomplices illegally possessing our rivers, lakes, haors, and canals. They often work in cahoots with the local administrations. The dumping of chemicals in almost all bodies is another national scourge.

Compared to other countries in the developing world, Bangladesh made relative progress in ensuring gender equality and women's participation in the national workforce. Still, the much sought-after and hard-gained progress in this sector has also been harmed by the oppression of women and a national culture of rape with impunity. The state has also not yet been able to reduce the marriage of underage girls significantly. As a result, children are giving birth to children. Women are still vulnerable and often victims of sexual exploitation in the economy's informal sector and patriarchal society. Mahtab (2012) has mentioned that worsening economic conditions also result in the rise of commercialisation and commodification of women, as evidenced by a higher incidence of trafficking and oppression. In search of a better life, many women migrate to new cities, both nationally and internationally, creating thousands of stories about women's plight and exclusion (Mahtab, 2012).

Like many other countries, neoclassical economists who dominate development thinking in Bangladesh have sought to make a rosy picture of our development by highlighting per capita income and GDP. Still, if we delve further based on conventional and non-conventional development indicators, we discover several pitfalls associated with our national development paradigm. It explains why we have not yet reached the much sought-after quality of life for all classes of people in Bangladesh that our development model promised. The growth we have experienced has not brought about any significant change in the quality of life for most people. In other words, our development model is questionable because "it has brought forth more complications than it has offered solutions to concerns and problems" (Islam, 2021).

Against this backdrop, it is time to review the neo-classical development paradigm for our national prosperity through national thinking, debate, and planning. The late-life realisation of Mahbub ul Haq, a world-renowned Pakistani economist who developed the HDI report, is worth remembering here. He said (Crossette, 1998),

"There is widespread consensus today that the purpose of development is not just to enlarge incomes but to enlarge people's choices, and that these choices extend to a decent education, good health, political freedom, cultural identity,

personal security, community participation, environmental security and many other areas of human well-being. A link between growth and human lives must be created through conscious national planning.”

Part II: Policy Suggestions

In the previous part, we have sought to delve into the paradoxical nature of the socio-economic progress that Bangladesh has experienced over the last three decades. However, the challenge is to reduce the nature of the contradictions with which the model of Bangladesh has been associated. A caveat is in order because there is no guarantee that the policy planners working with the Bangladesh Government will adopt these measures. However, these policy suggestions will at least enable this writer to join the ensuing policy debate that Bangladesh has been having due to the paradoxical nature of the development experienced over the last three decades. First, Bangladesh should rethink the neoliberal development model it has been implementing over the last three decades because this much-vaunted Reaganite and Thatcherite model has failed in many countries worldwide.

Second, Bangladesh should impose a wealth tax on the rich and distribute it among the poor so that the majority can share in the prosperity of the few. In other words, we should have a reasonably fair socio-economic system in which the rich and the poor can share in the prosperity.

Third, Bangladesh should establish a robust regulatory system that can establish order and control over various agencies that are corrupt, inefficient, and incompetent.

Fourth, it should undertake major infrastructural projects after a thorough feasibility study. At the same time, it should undertake developmental projects that we can implement with our existing technical knowledge and expertise as a nation.

Fifth, the ruling and opposition parties should sit in a national dialogue to develop and ensure a free and fair election system for periodic government changes. We should strive for national consensus in this regard. Otherwise, the country may be plunged into a civil war-like situation over the question and modality of the national election.

Sixth, the education system should be based on the Qudrat E- Khuda Education Commission's report. The government should strive for a single standard primary and high school education curriculum. Our present Madrassa system cannot be abolished. Instead, we should introduce science and technology as part of the Madrassa curriculum. Instead of building more educational institutions, we should provide quality education at the primary, secondary, and tertiary levels.

Seventh, ethical education and programs should be introduced to reduce, if not eradicate, the magnitude of corruption in national life. To reduce corruption,

all forms of government services should be digitalised. National accountability should be introduced at every level of public affairs and in every institution.

Eighth, we should not exclusively depend on the garments industry anymore; instead, we should diversify our industrial sphere by developing light engineering, pharmaceuticals, leather industry, jute, and agro-based industries.

Ninth, public health must be prioritised with sufficient budget and well-planned restructuring. Therefore, our health sector can be revamped by introducing accountability and inviting foreign competition.

Tenth, there is scope for improving the higher education sector by inviting foreign competition and attaching foreign faculty to every academic institution.

Eleventh, the productivity of our workers should be enhanced by introducing various skills training programs based on the Japanese model of human resource development. Technical education should be promoted as part of human resource development.

Twelfth, national and cultural rejuvenation should be achieved by imparting patriotic education, especially among the younger generation, invoking the spirits of the national liberation struggle.

Last but not least, women should be brought to the forefront of development activities so that they can be major stakeholders in this inclusive development model.

Conclusion

Bangladesh has faced many development challenges since its birth as a nation-state in 1971. It has put itself on a trajectory of development by overcoming major obstacles and financial constraints in the last few decades. In particular, the country has attained remarkable achievements in terms of sustained economic growth, food security, infrastructural development, educational attainment in quantity, and gender parity to some extent. In fact, it is on the road to transitioning from a Least Developed Country (LDC) to a developed country within a couple of years. However, its existing development model, which emphasises growth instead of holistic development, is paradoxical. Since it imitates the neoliberal development model, it is neither viable nor sustainable in the long run. Given these inherent limitations of the neoliberal model, we must accelerate the tempo of development in Bangladesh by introducing an environment-friendly, fair and egalitarian development that seeks to serve the majority of the people and not just the upper one per cent of the population. In other words, we must move beyond the neo-classical model of development that has created a paradox in our national life. It would be better if Bangladesh could adopt the policy suggestions outlined above. The faster Bangladesh deals with this development paradox, the better future beckons us.

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Situating Bangladesh in the New Industrial Revolution: Adopting Lessons from Developed Countries

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Abstract

The New Industrial Revolution (NIR) or Fourth Industrial Revolution (4IR) was first attempted by Germany in 2011. NIR broadly focuses on building an ultra-smart society by integrating digital technologies, such as the Internet of Things (IoT), machine learning, artificial intelligence (AI), and robotics, into auto-manufacturing. NIR is an indispensable element of the centennial vision statement of the University of Dhaka. Many advanced economies, such as the UK, Germany, and Japan, have already implemented I4.0 in their national policies. To fulfil the national and global targets and aspirations to keep pace with the worldwide speed of technological advancement towards the fourth industrial revolution, Bangladesh needs to learn from Industry 4.0 and Society 5.0 to adopt NIR in the policy agendas in its own ways. Through a qualitative approach, this paper is intended to familiarise NIR with the mass people and the stakeholders to accustom to the internalisation process of the fourth industrial revolution by developed countries with recommendations to internalise the exclusive benefits of NIR through adopting in the developmental policy agendas Bangladesh.

Keywords: *New industrial revolution (NIR) · Society 5.0 · Policy agenda of Bangladesh · development targets*

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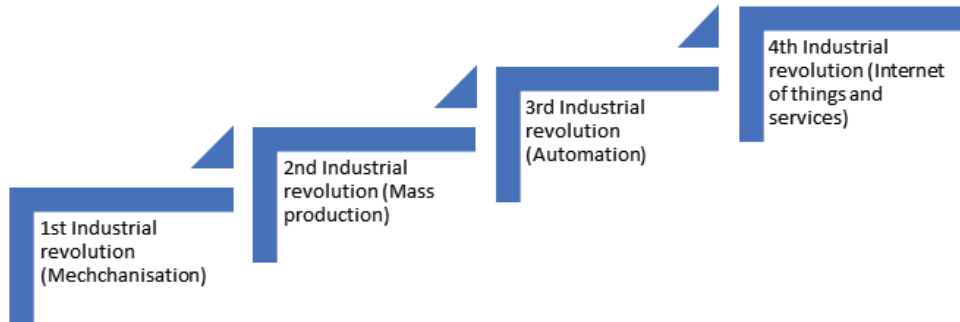
Introduction

Globally, with time, there have been some significant revolutions. Experts define them from various perspectives. The invention of the steam engine shed light on the first industrial revolution. Then, gradually, with the advancement of science and technology, the revolution moved forward at its own pace, meeting the demands of time. The world is currently enchanted with a new industrial revolution (NIR), the fourth industrial revolution (4IR). European country Germany initiated this term first and incorporated it into its policy. Gradually, other countries like the United Kingdom, Japan, and China have also included this strategy in their own ways (Majstorovic & Mitrovic, 2019). Japan included 4IR and worked on building an ultra-smart society named Society 5.0, emphasising 4NIR/4IR (Fukuyama, 2018). Bangladesh has a vision of being a developed country by 2041, and materialising NIR can assist in achieving the goal to a large extent. The lessons from developed countries and countries that have already incorporated NIR in their policy agendas can fuel the engine of achieving the growth targets on time. By mitigating the challenges of adopting NIR, it will be accessible to be on track with 4IR, mainly by concentrating on specialised education, digital training, and knowledge on adopting technological innovation.

Evolution of 4th Industrial Revolution

Mechanisation, mass production, automation and the Internet of things and services represent Industry 1.0, Industry 2.0, Industry 3.0 and Industry 4.0 respectively. With the passage of time, the advancement of technology, and the need-based requirements, there are multidimensional changes in every aspect of life. There will be many changes in the 4th industrial revolution. The business model is changing. Car firms will get more revenue from selling data and mobility services. Firms offering digital solutions will make more revenue than firms offering services done by people. Technology plays a vital role in business transformation and addressing resource constraints to a great extent. Chemical products will not be made from petroleum only but from bio-based ingredients and recycled materials. In the future, mining will mainly be done in asteroids and deep seas. Carbon emission will be an issue when considering investment in the energy sector. The computers will generate the news. Financial exchanges will occur in a block blockchain structure (Kodama, 2018).

Illustration: Evolution towards the Fourth Industrial Revolution



Source: Developed by authors based on Kodama (2018).

As depicted in the illustration above, the evolution towards the fourth industrial revolution focuses on the following—

- 1st industrial revolution- steam-powered machines;
- 2nd industrial revolution- mass production by division of labour and electrical energy;
- 3rd industrial revolution- electronics and IT, more automation, and
- 4th industrial revolution- cyber-physical production systems.

Methodology

This paper aims to derive lessons from developed countries that have already incorporated NIR in their development strategies to include in Bangladesh's developmental policy strategy. A qualitative approach is used in this paper. Books, scholarly journal articles, and reports from the World Economic Forum, European Union, etc., were used to develop the conceptual framework. Analysing the situation of developed countries, the challenges that Bangladesh can face are elaborately explained, and potential and possible solutions are mentioned. Based on existing literature, an attempt was made to identify the upcoming challenges that Bangladesh might face while materialising 4IR/NIR based on the experience of other developed countries, especially from Europe and East Asia.

Advantages of 4IR/NIR

Social and environmental problems are often created when the country strives for economic development. 4IR/NIR will resolve social problems while maintaining economic development. 4IR will add significant value to transportation, manufacturing, infrastructure maintenance, and health care. In 4IR/NIR, there will be many self-driving cars and more advanced network systems. Because of self-driving vehicles, older people can also move in quickly as they do not have to drive

themselves. The advanced data collection and network will mean fewer accidents, and artificial intelligence (AI) can choose the best route more quickly and easily, so travelling will be safer and more comfortable. In NIR/4IR, robots can regularly perform health check-ups. It will lead to early detection and cure of diseases. Plus, there will be more helper robots, reducing the pressure on healthcare personnel. The robots can do the check-ups on older people at home, so it will be convenient for them too, as they do not need to go to the hospitals regularly because it is far away from their homes. AI and big data can be used to analyse the market, leading to better product development. Robots can control the manufacturing process; this will be an excellent solution to labour shortages. It will lead to a more competitive business environment that will benefit the economy. With more information, better manufacturing processes can reduce greenhouse gas emissions and help the environment. In NIR/4IR, AI will analyse crop quality and weather, leading to more production. Robots will be used to control farming machines and will solve labour shortage issues. Self-driving cars can deliver goods to markets, and there will be no supply problems.

In markets, machine learning AI will provide suggestions for people about what food to buy based on their preferences and allergy conditions. AI will also be used to manage market inventory, leading to efficient food item management. AI will also make suggestions at home about what to buy and what to cook; thus, it will make cooking and eating a better experience for people. Again, 4IR/NIR will lead to better disaster management. There will be better monitoring of infrastructures such as roads and bridges through sensors, and they will be adequately maintained to reduce accidents. Disaster-prone areas will also be carefully observed using satellite information and drones. People will be appropriately notified of disaster and shelter information quickly through apps. Robots will facilitate rescue operations and relief efforts. 4IR/NIR will emphasise energy saving by efficient household energy consumption. It will try to increase energy output from renewable sources. Electric cars and renewable energy will also lead to less Greenhouse gas emissions and pollution, so this will be beneficial for the environment (Xu et al., 2018; GOJ, 2022; Vaidya et al., 2018; Mrugalska & Wyrwicka, 2017).

NIR / 4IR in Developed Countries

The world is undergoing rapid globalisation and technological transformation. Like Japan's Society 5.0, other countries have goals such as China aiming for "Made in China 2025", Asia trying to develop smart cities, Europe planning for Industry 4.0 and North America developing Industrial Internet. The goal is to achieve economic growth while resolving social and environmental problems. The UN also set a 2030 Agenda for Sustainable Development goal in 2015, in which all countries

will work together to achieve sustainable development (Majstorovic & Mitrovic, 2019; Fukuyama, 2018; Li & Pogodin, 2019).

Takakuwa et al. (2018) strived to find out the industrial development situation in Croatia- how far are they in implementing Industry 4.0, which another European country, Germany, developed. They showed that Croatia is still behind Europe in its manufacturing sector. They are still mainly in Industry 2.0, whereas the rest of Europe is in 3.0 and aiming for 4.0. Just 30% of all Croatian industries were in Industry 3.0. They realised they needed to develop a region-specific development model (Innovative smart enterprise model) to help them compete with other European countries. It aims to achieve Industry 4.0 Goals that develop smart companies and bridge the gap between machine and man.

The paper of Balland & Boschma (2021) aimed to find out the regions in Europe that can contribute to Industry 4.0 technologies. First, the researchers used patent data from the OECD REGPAT database and conducted co-occurrence tests to identify the topics related to Industry 4.0. Secondly, they examined the relationship between existing Industry 4.0 technologies and those introduced in those areas.

Lastly, they used the geography of Industry 4.0-related technologies in Europe to determine which regions will lead to knowledge production in this sector. They found that I4Ts are for the integration of manufacturing with information and communication technology. Their studies found that the technologies will penetrate a region if there are related pre-existing technologies. It strengthens the idea that technologies do not suddenly develop. They found out that some of the I4Ts existed before the start of Industry 4.0. Secondly, patenting increased in 2002-2011. Most patents were developed in cybersecurity. Most I4Ts saw an increase in the number of patents, but quantum computers saw a decrease.

The researchers found that the density of technology-relatedness can be used to find the potential of developing I4Ts of regions in the EU. They found that most of the top 20 regions are from Germany, France and the UK. There is variation in each region, that is, what type of technology they are making, e.g., German regions have high scores in developing autonomous vehicles but low scores in selling cyber securities. UK regions are advanced in augmented reality. UK, France and Finland are advanced in cybersecurity.

Japan incorporated the fourth industrial revolution strategy in its development agenda to develop an ultra-smart society based on NIR, Society 5.0. It can be defined as “A human-centred society that balances economic advancement with the resolution of social problems by a system that highly integrates cyberspace and physical space”). Before society 5.0, there were also societies 1.0, 2.0, 3.0 and 4.0. Society 1.0 was a hunter-gatherer society, 2.0 was an agrarian society, 3.0 was

an industrial society, and 4.0 was an information-based society. The information distribution was inadequate in Society 4.0 because people had to collect, analyse, and store most of the data. It was challenging to do this because there were problems with the ageing population and decreasing population, so there were fewer people for these jobs. In Society 5.0, the data collection will be done by sensors mainly and Artificial Intelligence, and the analysed data will do the analysis will be presented to humans again. All these will make life more comfortable for people in many ways (Fukuyama, 2018).

Society 5.0 is Japan's growth plan for achieving Sustainable Development Goals (SDGs). Other countries that face Japan's problems will need to learn from Japan how to solve these problems in the future. Bangladesh also has many things that it can learn from Japan's Society 5.0 initiative. First, because of digitalisation, security risks and privacy issues are becoming a major threat. Bangladesh needs to observe Japan and study how they deal with it. Bangladesh can use their findings to create a better digital environment.

Impact of Society 5.0 on Japanese Society and Technology

The ultra-development of information and communication technology (ICT) is responsible for the massive variation in society and industry. The changes are massively related to digitisation, which means digital transformation will originate new valorisation, which is why it is becoming the latest pillar of industrial policy. The Japanese government has pursued an aspiring policy program, "Society 5.0", to materialise this concept by following global trends. It was recognised as Japan's growth strategy.

The impact of 'Society 5.0' on Japanese society and technology can be expressed through three-dimensional perspectives. These are Social Impact, Economic Impact, and Technological Impact.

1. Social Impact

By achieving the goal of Society 5.0, Japan aims towards a human-centred society where anyone can benefit from their life through the newly invented innovation. The main advantages that humans can have are comfort, vitality, and high-quality lives. It benefits everyone regardless of age and gender and makes life more convenient, secure, and accessible. Humans can be liberated from cumbersome work and utilise their time effectively. As a result, everybody's life will be full of fun and happiness. Society 5.0 equilibrates economic development with societal improvement through offsetting social issues.

2. Economic Impact

Society 5.0 will not discriminate based on religion, sex, caste, language, or gender. In this system, everyone works according to their needs and capabilities, which is undoubtedly positive. It is expected to reduce income inequality. Society 5.0 has been crafted so that no one will be left from getting opportunities in the job and education sectors. Its motive is to provide benefits and enjoyment to all people in society, so there is a high possibility of reducing income inequality. But it is expected, and we still cannot see the whole outcome of this.

3. Technological Impact/ Digital Transformation

The core elements of Society 5.0 are IoT, AI, machine learning, robotics, and fintech. By using these instruments, the central vision of Society 5.0 will be accomplished. Lastly, by adding new values and creating communication between ‘people and things’ and ‘between reality and virtuality, it hopes for a better and sustainable society.

The roles of Institutions and Private Sectors

The concept of “Society 5.0 for SDGs” was initiated to link industry and academia. In Society 5.0, the most required thing is Creativity, where institutions can contribute a lot by educating people and creating new knowledge through research. Institutions can also provide widespread and objective input to design innovation, social systems, and economic mechanisms.

A tremendous positive side is that the private companies of Japan, such as Panasonic, NEC, Toyota, Fujitsu, and Hitachi, have also started incorporating Society 5.0 in their companies’ strategies. They have also implemented IoT, AI, and Robotics into their corporations, and the outcome is much more satisfactory. So, their response is mesmerising (Holroyd, 2022).

Society 5.0 would be realised by some potential sectors where the outcome of society 5.0 can be realised are discussed as follows:

1. Healthcare: In healthcare, the data will be shared and connected through all the users, including medical check-ups, reports, medical care, and nursing support, besides the use of remote-control medical care services and the use of AI and Robotics technology in the medical sector to support people’s independence.
2. Mobility: In transportation like buses, taxis, and cars, there will be an autonomous driving system that will make the rural transformation system more available. Robots and drones will also be available for mobility.
3. Infrastructure: Sensors, artificial intelligence, and robots will diagnose and maintain physical infrastructures, especially transport and communication.

4. FinTech: Society 5.0 promotes a cashless society. Besides FinTech firms and banks, it introduces ‘Open Application Programming Interfaces. Lastly, for money transfers, blockchain technology will be used.

The Major Societal Problems in Japan

There are many societal problems in Japan, such as a declining birth rate, a Shrinking Economy and labour force, an increasing senior population, and an increase in social security costs, which Japan needs to consider; otherwise, shortly it will create conditions for harmful impact on the economy and society. There is an assumption that other developing countries will also face those problems. Thus, Japan is denoted as “An advanced country with advanced issues”.

Bangladesh and the 4th Industrial Revolution

Rumi et al. (2020) found that our fear of the fourth industrial revolution is that technology will replace low-skilled jobs. Bangladesh has a high proportion of unskilled workers, so that it will be a concern for us in the future but not in the present. This is because most of Bangladesh’s industries cannot switch to smart industries quickly, plus many people work in the agricultural sector, so job loss will not occur soon. However, Bangladesh needs to keep pace with the NIR/4IR. To do so, Bangladesh needs to invest in technologies such as robotics and set up AI and computer research centres. The education system must also be transformed to keep up with changing demands. People need to work with critical thinking and bring innovations. The new jobs will require highly skilled people, and the education system needs to prepare graduates for them.

Moavenzadeh (2015) suggested the following elements which should be present in government policies for the growth of the economy:

- Tax policies should be simple for manufacturers but should also ensure competition.
- Policies that ensure free and fair trade should be implemented.
- Some policies should be taken to help develop talented individuals from schools and the workforce.
- The policies should encourage technology and innovation.
- Energy and infrastructure demands should be met.

Islam et al. (2018) found the following issues of Industry 4.0 in Bangladesh:

- Lack of government support- The government does not have clear policies about implementing automation in industries like RMG and shipbuilding.
- Lack of Knowledge- Key planners and people in upper management have

limited knowledge about implementing automation and technological integration.

- Poor Infrastructure- Bangladesh has poor road communication and network issues, plus there is no large market for technological goods and services.
- Availability of Cheap Labor- Cheap labour is available in RMG industries, so owners are not eager to introduce automation.
- Expensive installation of technologies- It is initially expensive to install the technologies, but it will be more profitable in the long run. Still, many companies are not ready to invest in the first step.

Bhuiyan et al. (2020) investigated the prospects of Industry 4.0 in agriculture and stated that some features of Industry 4.0 are being used in agriculture on a tiny scale. Advanced devices are used to find soil moisture solar irradiation and mobile apps are used to see weather forecasts. They stressed that policy-makers, authorities, business people, scholars and consumers should be fully aware of Industry 4.0. To make them more aware, some programs, such as seminars, trade fairs, and overseas training programs, should be held. Introducing technological advancement requires substantial financial investment. However, banks are unwilling to take such risks, so the government should incentivise banks to give loans to SMEs to begin automation. The elements of Industry 4.0, such as AI and robotics, are viewed with distrust, and people are reluctant to change from traditional ways. There are also legal issues related to the implementation of these technologies. These must be resolved to bring about the 4th Industrial Revolution in Bangladesh.

Jobs involving physical labour will be replaced by intelligent machinery and robots. New technically skilled jobs will be created, including working with robots. The government should invest in skill transformation so that there will be enough work force for future jobs and people from other professions can join this sector. Industry 4.0 will create an integrated online network. For this, digital infrastructure needs to be strong; otherwise, data-leaks security breaches and hacking will be common. More research and education are necessary in this sector (Bhuiyan et al, 2020).

Shabur et al. (2021) found that 4IR is not yet established in many places of Bangladesh, not even Industry 3.0, because of a lack of adequate knowledge, inadequate infrastructure, an abundance of cheaper labour, lack of willingness and expensive installation of technologies the following outcome can be found if proper implementation of 4IR is possible in Bangladesh:

1. Economic growth (improvement of production, supply chain, smartness of production)

2. Mass production, mass personalisation, made-to-measure, agile production.

Bangladesh has a vast garment sector that employs almost 4 million people, and there are nearly 5000 factories throughout the country. There are 67 Leadership in Energy and Environmental Design (LEED) green factories in Bangladesh. Out of these 67, 13 are platinum rated. It shows that the RMG sector has an excellent opportunity for Industry 4.0.

All factory owners, employees, government officials and experts need to work together to put Industry 4.0 into action. Everyone needs to be appropriately educated. Training sessions and seminars need to be held regularly. ICT infrastructures must be improved to initiate and sustain Industry 4.0, and manufacturing patterns need to be reconfigured to introduce smart production lines. At first, there will be issues such as lower profits and waste management. Gradually, profits will increase, and waste management will be more efficient, so employees and employers must be patient and stay motivated. Experts should be brought from countries where Industry 4.0 have already been installed, such as Germany. The government must provide tax incentives for companies developing smart systems (Shabur et al., 2021).

Moktadir et al. (2021) identified the critical problems in implementing Industry 4.0 in Bangladesh. Lack of technological infrastructure, data insecurity, high investment, proper connectivity among companies, lack of skilled management teams, decreasing job opportunities, and adverse environmental impacts were noteworthy. If technological infrastructure could have been developed, other challenges could have been overcome more quickly, so designing it is of utmost importance. Industrial activities may destroy the environment. If smart and cleaner processes are adopted, the environment will be saved. Using smart machines, human contact with harmful chemicals will also be reduced so that people will be safe from different types of danger present in the current processes. Industries can make environmentally friendly production processes using Industry 4.0 technology.

The paper of Chowdhury and Kibria (2021) concentrated on the present status of Industry 4.0 in Bangladesh, what can be done in the future, and how COVID-19 has hampered the transformation of existing industries into industry 4.0. The researchers observed some industries in various sectors and conducted semi-structured interviews. They concluded that most industries are now in beginner or level 1 according to the IMPULS Industry 4.0 readiness model. However, many sectors have plans to implement Industry 4.0 in the future.

Garments and other industries also intend to get more technology in their production process. Most industries were affected by the pandemic, but some were less affected due to their previously installed automation, and many industries plan to install industry 4.0 technologies in the post-Covid era.

Challenges of Implementing NIR in Bangladesh, including Potential Solution

The Internet of Things and artificial intelligence are the core elements of the fourth industrial revolution. Excessive dependency on the internet has drawbacks as well. There is an increased risk of substantial structural unemployment due to the replacement of labour by machines, which includes wider inequality in the labour market. Thus, blended education and technical training skills will be advantageous for employment. Therefore, a drastic change in the overall education system prioritising vocational and practical orientation of knowledge might assist in mitigating the adverse impacts. Specialised, scientific, technical, technological, and need-based education for adopting new inventions and innovation of technology should be given prior importance while formulating the new education system to keep pace with the NIR/4IR.

Maintaining sufficient digital security in financial transactions will be required. Since the upcoming financial world will focus on FinTech, cyber security will be crucial in the digital economy. Strong knowledge of DigiTech can mitigate the probable data theft and offset the cyber threats. Initiatives should be taken from the current period to prepare a workforce that can face the challenges of 4IR and possess immense potential to integrate into the digitally developed world, such as Bangladesh.

Investment in research and development on multifaceted aspects is highly recommended to mitigate the challenges of coping with the global industry.

Conclusion

The advent of the fourth industrial revolution can hardly be denied due to its immense importance. The developed countries have incorporated the NIR/4IR strategies in their development goals to keep their growth target aligned with their respective and global targets. Bangladesh is not an exception. The government of Bangladesh has taken many initiatives to familiarise itself with NIR. However, there is a vast scope of work to offset the upcoming challenges, and there is no alternative to digital education and practical ways of learning, including hands-on training. The government agenda should prioritise fundamental knowledge of science, FinTech, research and innovation. The target of being a developed country by 2041 largely depends on how close Bangladesh can reach the threshold level towards materialising the fourth industrial revolution. The lessons from developed countries can assist to a great extent.

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Evaluation of Agricultural Policies and its Impact on Agricultural Development in Bangladesh

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Abstract

Agricultural policies strive to improve agricultural welfare by ensuring agricultural development, raising productivity, enhancing food safety and security, safeguarding and improving natural and biological resources, and building producer organisations. The major influence of agricultural policy on agricultural growth is establishing national self-sufficiency in food production, boosting farm family living standards, conserving agricultural resources, and minimising population pressure in the agricultural sector. Agriculture provides approximately 15% of GDP, with the crop sub-sector contributing 9%. Various agricultural organisations, including the Bangladesh Agricultural Research Council, BADC, were formed and resurrected under the direct supervision of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, and the breadth and dynamics of the agricultural extension service were expanded. The agriculture industry is critical to Bangladesh's overall economic development. According to the Quarterly Labour Force Survey 2020, the agricultural industry (crops, animal farming, forests, and fishing) produces 14.74 percent of the country's GDP and employs approximately 41 percent of the labour force. Rice currently covers about 75 percent of the cultivated land in Bangladesh. Area coverage by other crops is as follows: pulses (4.64%), wheat (3.92%), oilseeds (3.77%), jute (3.71%), sugarcane (1.23%), potato (1.11%), fruits

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(0.84%) and vegetables (1.39%). Agriculture's sectoral contribution has been dropping over time, with the service sector capturing the lion's share in the early 1980s. With the rapid rise of the industrial sector, the service sector began to thrive and rose to first place in Bangladesh. Even though the population has doubled from 70 million to 180 million, agricultural productivity has increased sufficiently to sustain this population. Over the previous three and a half decades, Bangladesh's agriculture has undergone substantial structural changes and achieved significant success.

Keywords: Policy · development · growth · environment and productivity

Introduction

Agriculture is the backbone of Bangladesh's economy. The country's agro-based industries rely heavily on it for raw supplies. The bulk of people's source of food and nutrition, jobs, and income creation. It is the primary economic activity of the rural poor to alleviate poverty. Many of us regard it as the lifeblood of Bangladesh's rural economy. This sector, however, is threatened by a 1% annual decline in productive land. Land quality is degrading due to soil fertility degradation. Water resources are also diminishing as a result of massive water uplift. Our government's challenge is to conserve precious resources, enhance raw material availability, boost food production and decrease poverty. Agriculture is the only option for meeting the issues. Agriculture must expand at least 4% yearly to keep the GDP growth rate at 6-7%. Agricultural modernisation and the linkage of supply chains between producers and consumers in domestic and international markets may make it possible. As a result, national policies relevant to the current agro-economic setting must be revised and updated. Agriculture employs approximately 41 percent of the entire labour force in the country. Agriculture provides approximately 15% of GDP, with the crop sub-sector contributing 9%. Various agricultural organisations, including the Bangladesh Agricultural Research Council, BADC, were formed and resurrected under the direct supervision of the Father of the Nation, Bangabandhu Sheikh Mujibur Rahman, and the breadth and dynamics of the agricultural extension service were expanded. As a result, the country attained food grain self-sufficiency. As a result of the advancement of modern kinds and technology, many fruits and vegetables are produced with improved production throughout the year. Modernisation of agriculture has been prioritised in various agricultural policies to accomplish poverty reduction, food and nutrition security, and agricultural expansion.

Objective

Agricultural policies strive to improve agricultural welfare by ensuring agricultural development, raising productivity, enhancing food safety and security, safeguarding

and improving natural and biological resources, and building producer organisations. The overall objective of this study is to evaluate agricultural policies critically and document the visible impacts of these policies. The specific objectives are:

- a. to accumulate the policies in the agricultural sector;
- b. to document the impacts of agricultural policies in different fields of crops, livestock and fisheries; and
- c. to suggest further policy guidelines.

Methodology

The study area was selected based on secondary data to accomplish objectives. The Ministry of Agriculture, Ministry of Fisheries and Livestock, BARC, DAE, DoF, DLS, and NARS have introduced many policies. The evaluation was made after exploring the policies provided by these government bodies, FGD and KII. The implications of these policies were measured by comparing the collected secondary data. Data were collected from the available national secondary sources from November 2021 to April 2022.

National Agriculture Policy, 2020

Crop Production Policy

Although the intensification of food grain production, especially the rice-based production system, is profitable from the farmers' point of view, this approach has appeared to be harmful in protecting land productivity. Rice currently covers about 75 percent of the cultivated land in Bangladesh. Area coverage by other crops is as follows: pulses (4.64%), wheat (3.92%), oilseeds (3.77%), jute (3.71%), sugarcane (1.23%), potato (1.11%), fruits (0.84%) and vegetables (1.39%) The production system dominated by a single crop (i.e. rice) is neither scientific nor acceptable from the economic point of view. It is, therefore, necessary to increase the cultivation and production of other crops. However, considering the increasing demand for food grains and to ensure food security, the production of rice will continue to be a priority in food grain production programs. In order to increase rice production, supportive programs will be implemented to raise per hectare yield through modern technology and improved cultural practices along with the increased use of HYV seeds.

In Bangladesh, only 4.14 percent of net cultivable land remains fallow, which means that there is hardly any scope for increasing cultivable land. Currently, cropping intensity is around 185 percent. Thus, the only possible option for increasing agricultural production is to increase both cropping intensity and yields simultaneously.

Crop diversification is one of the significant components of crop production policy. Particular emphasis will be placed on crop diversification programs under the crop production policy for the overall development of the crop sector. The government policies in this respect are as follows:

The area under wheat has meanwhile reached 0.8 million hectares. Given the potential for expanding wheat acreage, efforts will continue encouraging farmers to grow more wheat. The production of maize has shown prospective results in the last two years. Maize has also gained popularity as a human food alongside poultry feed. Public sector procurement of maize, like rice and wheat, has been introduced to encourage farmers to cultivate maize. The efforts to increase the area and production of maize will be strengthened. The program for increasing the area and production of other crops, e.g., potatoes, pulses, oil seeds, vegetables, fruits and spices, will gradually be extended under the crop diversification program. Production of different cash crops, including jute and cotton, will be increased, and efforts will be made to expand their multiple uses. Special development programs will be taken to increase the production of potential crops suitable for the coastal areas and the hill tracts. The production of crops, especially *aman* crops, is heavily damaged yearly due to the inadequate soil moisture regime prevailing in drought-affected areas. To combat this situation, the government has adopted the following policies:

- Supplementary irrigation will be ensured in severe and extremely severe drought affected areas.
- Suitable crops for specific locations (including hill tracts) will be identified based on technological and economic parameters, and appropriate strategies will be pursued for cultivating those crops.
- Measures will be taken to minimise post-harvest losses by introducing appropriate technologies.

Seeds

At present, only a tiny portion of the required quality seeds for different crops is supplied by the Bangladesh Agricultural Development Corporation (BADC). The rest of the seeds are produced, preserved, and used by private management, especially at the farmers' level. The government has already declared the National Seed policy to promote the seed industry in the private sector. In pursuance of the seed policy, the government has revised the Seed Act of 1977 and formulated seed rules in light of the Seed Act (Amendment) 1997. In this respect, the government will follow the policies mentioned below:

- In light of the prevailing seed act and seed rules, the government will retain the opportunities already provided to the private sector for seed production, import, and marketing alongside the public sector.

- An appropriate mechanism will be devised to improve the private sector's technical skills in seed treatment, seed preservation at a specific moisture level, and seed storage management so as to ensure the highest quality of seeds.
- The act of favourable policy preparation, technical support, training, etc., will be strengthened to encourage private sector participation in seed development and preservation.
- Improved technology-based seed production, seed multiplication, and related farm activities have been declared industrial enterprises in the present industrial policy. This policy will be continued, and adequate government support will be provided for the development of the seed industry.
- In addition to producing and marketing seeds in the public and private sectors, the policies relating to seed production and preservation at the farmers' level will continue so that the farmers can easily use good quality seeds. The government has, meanwhile, taken the initiative to strengthen the activities of BADC in this regard. During the Fifth Five Year Plan period, necessary steps will be taken to raise BADC's seed distribution programme to ten percent of the total demand.
- The already introduced seed buffer stock system will continue to ensure the normal supply of seeds of major crops during natural calamities or other disasters.
- The conditional opportunity that has already been given to the private sector to import hybrid rice seeds to increase rice production will be further consolidated based on performance analysis. However, special care will be taken to ensure that the private sector produces hybrid seeds locally and that the hybrid seeds offer higher yields and more financial benefits to the farmers on a sustained basis.
- At present, the Seed Certification Agency (SCA) is the only legal authority to certify seeds. To increase the supply of quality seeds, private sector agencies participating in the seed production programmes will be allowed to market their 'truthfully labelled *seeds*' alongside government agencies. The Seed Certification Agency will have the legal authority and responsibility to closely monitor the respective private sector organisations' entire seed labelling and certifying process. The Seed Certification Agency will become a member of the International Seed Testing Association (ISTA) to create opportunities for exporting internationally standard seeds.

Fertilisers

Chemical fertiliser is one of the main inputs required to increase crop production. The expansion of modern agricultural practices and intensified cultivation have led to an increasing demand for fertilisers. It is, therefore, necessary to ensure a timely supply of fertilisers to match the demand. As a result of the unbalanced use of fertilisers, land fertility is declining on the one hand, and the potential yield is not achieved on the other. In this respect, it is essential to adopt and implement such policies to encourage farmers to use balanced fertilisers and, at the same time, protect soil fertility.

Minor Irrigation

Irrigation is the leading input for increasing the yield and production of food grains and other crops. About 90 percent of the total irrigated area of the country is covered by minor irrigation. A well-planned irrigation management program is, therefore, essential for gradually increasing cropping intensity and yield. It is against this background that the National Agriculture Policy has given special emphasis on the development of minor irrigation.

As a result of liberal importation of irrigation equipment, shifting of irrigation management to the private sector and withdrawal of siting restrictions and standardisation of irrigation equipment, the total area irrigated and the number of irrigation equipment have significantly increased, which has appeared to be the driving force for increasing production of food crops, especially rice and wheat. However, the major source of irrigation expansion has been the groundwater technologies, predominantly Shallow Tubewell; irrigation by Deep Tubewell has virtually not increased in recent years. Although there is much prospect for surface water irrigation, it has not been expanded to 'any significant scale. Instead, the withdrawal of siting restrictions and standardisation of irrigation equipment has negatively impacted the efficiency of irrigation management. For example, in some places, a much larger number of equipment has been installed than technically required, and many of those installations have turned out to be physically and technically inappropriate. Such phenomena have resulted in capacity underutilisation of pumps and increased the cost of irrigation, increasing production costs. In this respect, appropriate steps will be taken to develop and extend minor irrigation systems in light of the National Water Policy and Water Resources Development Plan.

Although minor irrigation is mainly in the domain of the private sector, the onus of improving irrigation efficiency still lies with the government. In this context, the primary goal of minor irrigation management under the purview of Agriculture Policy is to accelerate crop intensification and increase yields

through planned utilisation of surface and groundwater in an environment-friendly atmosphere. To achieve this goal, activities of various agencies involved in surface and groundwater irrigation programs will be coordinated at the national level. Specifically, the following steps will be taken to strengthen irrigation management:

- Efforts will be made to reduce irrigation costs by improving irrigation efficiency, promoting appropriate technology, increasing irrigation command area and upgrading irrigation management.
- Irrigation from surface water will be a priority, and suitable programmes will be developed to expand and consolidate appropriate technology. Emphasis will be given to the conjunctive use of ground and surface water in accordance with the government's National Water Policy and Water Resources Development Plan.
- Infrastructures will be built to capture surface water from khals, beels, and small rivers, and the availability of irrigation water will be increased by using high-capacity power pumps. Besides, small rivers, khals, dighi, derelict ponds, etc., which have been silted up, will be re-excavated to augment water flow for expanding irrigation facilities. Such water bodies will be used for fish production while tree plantation will be done on the two sides of the khals.
- Since irrigation by electrically operated equipment is cheaper and more efficient, priority will be given to electricity connections and supplies for irrigation pumps.
- In severely and extremely severe drought-affected areas, the government's decision to strengthen supplementary irrigation during the transplanted aman season will continue. Also, required technical support for electricity reconnection to irrigation pumps during the *aman* season will be provided along with other forms of assistance.
- Special location-specific programmes will be undertaken to improve the irrigation system. Irrigation programmes will be undertaken following proper strategy according to surface and groundwater availability. Farmers will be motivated to harvest rainwater for irrigation, and appropriate programmes will be taken to promote rain-fed farming. Suitable projects will be undertaken to build water reservoirs to capture tidal water and expand mechanised irrigation facilities in the coastal areas. In this regard, participatory programmes for the local beneficiaries will be undertaken.
- In backward and underdeveloped areas, the government will initially implement irrigation programmes. Gradually, the private sector will be motivated and provided with the necessary support to develop ways and

means of expanding irrigation, as well as to market and install appropriate irrigation technologies.

- Private sector initiatives for repairing and maintaining irrigation equipment at the local level will be encouraged further. Special programmes will be undertaken to provide technical assistance for increasing technical competence, including credit support for promoting mechanics' services at the local level.
- The farmers will receive necessary training and technical assistance to reduce water loss through increased irrigation system efficiency and increased command areas per pump.
- To ensure optimum water usage, the intensity of crop production will be increased through a crop diversification programme based on the identification of suitable cropping patterns. Under the programme, farmers will be motivated by the introduction of suitable irrigation methods for growing different crops.
- The irrigation management system will be regularly monitored, and the required data will be collected and analysed to provide guidelines for improvement. Adequate steps will be taken to deliver information on irrigation equipment regularly to farmers and traders who are investing in it.
- Coordinated steps will be taken in collaboration with the concerned agencies to effectively monitor how underground water levels fluctuate over time and what possible impact this might have on irrigation development in the future.
- Measures will be taken to minimise any adverse impact of the withdrawal of siting and standardisation requirements by properly advising the farmers and creating awareness about the technical and financial implications of the dense installations of irrigation equipment.
- Research will be strengthened to assess the present status and determine future programmes on the availability of irrigation water, the use and impact of irrigation technologies, etc.
- Reservoirs will be built up to tap water from the year-round stream flow in hilly areas, and appropriate infrastructure will be developed for irrigation and fish culture.

Pest Management

Integrated Pest Management (IPM) will be the central policy for controlling pests and diseases. More importance will be given to the following activities for pest

control under the Agriculture Policy:

- Farmers will be motivated to use more pest-resistant varieties of crops. Modern cultivation practices will be followed to reduce the incidence of pest infestation.
- Mechanical control measures such as light traps, hand nets, etc., will be increased and popularised. Biological control measures will be used to destroy harmful insects and preserve useful ones.
- Regular training and discussion programmes on IPM will be conducted among farmers under the supervision of the Union Agricultural Development Committee to successfully introduce and popularise the method at the farmers' level.
- Pest surveillance and monitoring systems will be strengthened.

Chemical pesticides will only be used in cases where IPM fails to control the pests. The following measures will be taken in respect of the distribution and use of chemical pesticides in the light of existing rules and regulations:

- The production, import, distribution, or use of any chemical pesticide that is directly or indirectly harmful to human, animal, or aquatic health.
- Use of any chemical pesticide harmful to the natural environment will be discouraged and eventually banned.
- The system of pesticide approval at the national level will be continued, and its monitoring and testing of the effectiveness of approved pesticides will be strengthened.

Agricultural Mechanization

The severe scarcity of draft power necessitates using mechanical power for agricultural production activities. The government has, therefore, attached particular importance to agricultural mechanisation. To encourage the use of machines in agriculture testing and standardisation, restrictions have already been withdrawn from the free market distribution system. As a result, the use of agricultural machinery has increased significantly, and immense potential has been created for further growth. In order to accelerate the current trend of agricultural mechanisation, various facilities, including the exemption of import duties on agricultural machinery, have been provided, and the same will continue.

The following steps will be taken to promote agricultural mechanisation:

- The type of agricultural machines or the level of mechanisation needed in any region depends on the socio-economic condition of the people, the number and quality of draft animals and the availability of agricultural labour in

that region. Measures will be taken to collect and publicise this information through the mass media to attract private investment in this sector.

- To gradually reduce dependence on draft power, efforts will be made to grow farmers' interest in mechanisation and provide credit facilities. To achieve this goal, information relating to increasing potential demand for and profitable investment in agricultural machinery will be publicised through the mass media so that the private sector can play an active role in creating a competitive market.
- Despite the increasing use of mechanical power in agriculture, animal power will continue in the future depending on the socio-economic conditions of the farmers in different regions. Therefore, an improved 'power delivery system' (meaning delivery of energy from the shoulder of the draft power to the agricultural implement) will be evolved through research so that the scarce draft power can be utilised more efficiently.
- Production and import of agricultural machines will be especially encouraged so that farmers can procure machines from the market according to their choice and convenience. Machinery workshops and industries engaged in agricultural mechanisation activities will be provided with appropriate tax/duty facilities to import necessary raw materials. This is expected to keep machine prices within the farmers' purchasing capacity.
- To speed up the process of agricultural mechanisation, the necessary credit support will be provided to both producers and machine users.
- Individual farmers are not often able to afford the use of expensive machines. To popularise mechanisation in addition to the use of draft power, farmers will be motivated to purchase or lease agricultural machines through cooperatives. Formation of such self-motivated cooperatives will be encouraged, and necessary support will be extended to mechanised cultivation based on cooperatives.

Agriculture Research

A well-coordinated research plan is essential for the rapid development of the crop sector. A two-dimensional agricultural research management program will be followed to transform the crop production system into a profitable and sustainable sector. On the one hand, priorities will be given to developing low-cost appropriate technologies for the small, marginal and medium farmers, including women, to resolve their identified problems. On the other hand, applied research will be strengthened through advanced research methodology by providing necessary research facilities. The following steps will be taken to fulfil the expected goals of agricultural research:

- The social, economic, and marketing research programmes of all the National Agricultural Research Institutes and the Department of Agricultural Marketing (DAM) will be strengthened to determine the economic importance of crop production.
- The government's already established National Agricultural Research System (NARS) will be strengthened and coordinated further through periodic evaluation.
- The programme already undertaken to transfer and popularise the technologies evolved by different agricultural research institutes through the private sector and NGOs at the field level will continue.

National Agricultural Research Institutes will, in principle, give priority to the following subjects in preparing their time-bound and target-oriented research programs:

- Soil and agro-ecological Zone (AEZ) specific research;
- Research relating to the development and application of fertilisers which are harmless for soil quality, environment and health;
- Research on preservation and development of land productivity in different regions;
- Region-wise research on irrigated and rain-fed cultivation;
- Farm management research with a view to minimising production cost and maximising farmers' income;
- Research on identifying different regions of the country from the economic point of view as the most suitable and profitable for specific crops and cropping patterns;
- Research on the preservation of existing bio-diversity of different crops;
- Research relating to IPM and development and application of pesticides from indigenous plants;
- Research on improving the quality and utility of various crops;
- Research on meeting the increasing demand for food-based nutrition through increasing crop diversity;
- Agro-economic research on the trend and impact of domestic and export demands for different crops;
- Research on preservation and processing of crops and reduction of crop losses;
- Research on enhanced participation of women in agricultural activities and removal of constraints;

- Research relating to the development of crop varieties and technologies suitable for drought and flood conditions;
- Research on developing short-duration improved varieties of seeds for different crops;
- Agronomic and economic research on crop diversification;
- Research on the development of improved crop varieties and technologies suitable for cultivation in coastal, hilly, water-logged and salinity-affected areas;
- Research on developing improved varieties and technologies for the deep water rice;
- Research on developing technologies for integrated rice cum fish culture; and
- Research on marketing and price trends of different crops.

Agriculture Extension

The extension of agriculture is one of the main components of the national agriculture policy. There is a need to strengthen agricultural extension services to ensure the proper use of agricultural land and improve land productivity. The Department of Agricultural Extension (DAE) is responsible for providing information on appropriate technologies to the farmers, educating them through proper advice and training, and motivating them to adopt improved technologies. To strengthen the extension mentioned above services, the following steps will be taken:

- The New Agricultural Extension Policy (NAEP) is currently being implemented. Its objective is to promote sustainable technology for the gradual development of an improved crop production system. The implementation of NAEP will be reinforced through necessary monitoring.
- The agricultural research-extension linkage will be further strengthened to transfer new technologies to farmers; private sector entrepreneurs, NGOs, and farmers will also be involved in strengthening this linkage.

The present agricultural extension set-up is sufficiently broad-based and bolstered by efficient workforce. The following measures will be taken to make this organisation more efficient and effective:

- DAE will prepare feasible and compatible programmes for properly using cultivable land based on demand for different crops and their production targets.
- DAE will regularly monitor the supply and availability of quality seeds, fertilisers, irrigation, pesticides, etc., to facilitate the cultivation of

different crops. Besides, DAE will prepare an anticipated report on the increase/decrease of crop-wise demand for different inputs and apprise the authorities at the national level.

- The use of public mass media, such as radio, television, newspaper, etc., will be increased to rapidly extend agricultural technologies. In this connection, the Agriculture Information Service will be strengthened.
- Proper use of Annual Development Plan (ADP) allocations to local government will be ensured. Block-wise establishment of demonstration farms, which is already in practice, will be strengthened. DAE will determine suitable crops that are compatible with the farms' overall conditions. Visits to demonstration farms and interaction with the farmers by the extension workers at an essential time of the respective cropping season will be further strengthened.
- Multiple extension approaches, such as agricultural fairs, field days, farmers' rallies, etc., will be widely practised to facilitate the rapid transfer of agricultural production technologies.
- The extension service of agriculture will be strengthened to encourage a self-motivated cooperative production system.

Agriculture Marketing

Marketing of agricultural commodities is inextricably related to their production. However, the Department of Agricultural Marketing (DAM) remains the weakest of all the existing organisations in the agriculture sector. Markets for agricultural commodities are generally under intermediaries's control, which is very discouraging for the farmers. In preparing marketing programmes, the following points will be taken into consideration:

- Crops will be stored and preserved in proper conditions to ensure uninterrupted supplies throughout the year and cope with crop overproduction. The use of any harmful chemical in this process will be controlled.
- Developing a transportation system will ensure the timely supply of the right quantities of crops at the right places.
- Processing facilities will be developed to reduce the wastage of rapidly perishable crops, increase utility, and maintain the quality of agricultural commodities.
- Grading and standardisation will increase the export of agricultural commodities. To increase local consumption of such crops, necessary measures will be taken for grading, standardisation, labelling, and quality

development according to consumers' tastes, preferences, and food values.

- The proper development of marketplaces and related physical infrastructure will improve the efficiency and effectiveness of marketing programmes.
- Market-related information would be supplied to farmers, traders, and consumers through strengthening the market information service.
- Consumers/users, traders, and processors will be informed about the production, utilisation, processing technology, etc., of new crops.
- Establishing a marketing database and analysing the data will provide necessary assistance in solving marketing problems at the government and non-government levels.
- The Agricultural Commodity Market Control Act of 1964 (revised in 1985) will be updated and implemented.
- To ensure fair prices of crops, measures will be taken to establish a linkage among the producers, traders, exporters and processors through the 'contract sale' of crops.
- Self-motivated cooperative marketing system will be encouraged.
- Necessary output price supports will be provided, and food grain procurement will be strengthened to ensure a fair price of crops during the harvesting season and stabilise prices when crop damage or overproduction occurs.

Land Use

The government has the primary responsibility of ensuring the optimum use of land. Although land is a privately owned property in general, its use has to be compatible with the overall social goals and utility. Moreover, it is crucial to consider that the interests of small, arid marginal farmers and sharecroppers are protected, as they constitute the majority of farmers.

The following steps will be taken to ensure planned utilisation of land for crop production:

- The Soil Resources Development Institute (SRDI) will prioritise the land zoning programme and strengthen its integrated approach.
- To ensure maximum land utilisation, bottom-up planning will be used, with people's participation and implementation starting from the mouza or village level.
- In most areas, the same land is suitable for more than one crop. Therefore, farmers will be encouraged to grow more profitable crops as an alternative to the rice-rice cropping pattern.

- Fertile agricultural land is being lost to cultivation due to its use for non-agricultural purposes such as private construction, house building, brickfields, etc. In light of the government's land policy, appropriate measures will be taken to stop this trend.
- Maximum land utilisation will be ensured by promoting inter-cropping with the main crops.
- Acquisition of land over the requirement for non-agricultural purposes will be discouraged.
- Programmes will be implemented to motivate landowners not to keep their land unused without an acceptable reason.
- Appropriate measures will be taken in light of the Land Policy to protect the interests of small and marginal farmers and sharecroppers and ensure that agricultural land is not kept fallow for an extended period.

Agricultural Education and Training

One specific objective of the Agriculture Policy is to develop efficient manpower in agricultural disciplines to increase the production rate on a sustained basis. Bangabandhu Agricultural University has been established alongside Bangladesh Agricultural University to expand the scope of agricultural education. In the light of the National Education Policy, policies adopted by the government for the expansion of agricultural education and training are as follows:

- Steps will be taken to improve and strengthen the administrative and academic management of agricultural colleges established by the government. Appropriate measures will be taken, if necessary, to facilitate coordination and reforms in the administrative management of these colleges;
- The number of agricultural education institutions will increase to the required level. A pre-determined standard and facilities will be ensured for establishing and managing any agricultural college.
- All the agricultural colleges will be managed according to the curricula and examination rules of the relevant universities. Adequate measures will be taken to facilitate higher studies, research and on-the-job promotion for the teaching staff of agricultural colleges.
- Steps will be taken to strengthen the technical standards, administration, and management of 13 Agricultural Training Institutes (ATI) that offer diploma courses.

In order to make agricultural credit more accessible, a program to advance bank loans at an increasing rate will be implemented. Besides, the Ministry of

Agriculture has prepared an outline of an institution titled 'Agricultural Credit Foundation' following the Palli Karma Shahayak Foundation model to strengthen the agricultural credit system. The Agricultural Credit Foundation will be a non-profit organisation under the Company Act of 1994 with the primary objective of increasing investment in agricultural activities through meeting the demand for credit by the landless, marginal and small farmers and, at the same time to alleviate poverty and raise the overall living standard by creating new employment opportunities through intensification of crop cultivation and agricultural diversification. Programs will be taken up to identify different government, semi-government, non-government development agencies and social organisations as the 'partner organisations' to channel micro-credit through them. To establish this institutional entity, necessary steps will be taken during the current Fifth Five-Year Plan (FFYP) period.

Government Support for Agricultural Production and Contingency Plan

It is necessary to take up government-support programs to encourage farmers to use modern technologies to increase crop production. Steps to be taken by the government in this respect are:

- Government support may be provided to farmers in various ways, such as reducing the prices of agricultural inputs, ensuring fair prices for agricultural products, exempting duties and taxes, sharing the cost of supplementary irrigation, lowering the rates of interest on agricultural credit, etc. A provision of block allocation for the Ministry of Agriculture will be kept in the Annual Development Programme (ADP) for this purpose. This money will only be used for government agricultural support programmes.
- The government will undertake contingency support programmes to compensate farmers for losses due to natural disasters. For this purpose, the revenue head of the Ministry of Agriculture will keep a provision for block allocation.
- The Ministry of Agriculture will have a contingency plan for implementing emergency agricultural rehabilitation programmes (ARP) to recover from crop losses due to any natural disaster at both the farmer and national levels.
- An early warning system will be strengthened to inform the farmers about their roles in adverse weather conditions based on specific information analysis. A plan is being prepared by the Department of Agricultural Extension (DAE) to provide an 'extension message' based on agro-

meteorology. An agro-meteorological centre will be established in the DAE for this purpose. The primary function of this centre will be to analyse agro-meteorological and agro-climatic data, forecast the sowing/transplanting time and possible yields of crops to the farmers, and provide agro-meteorological advice.

Food-based Nutrition

As a follow-up to the World Declaration of the International Conference on Nutrition, 1992, the following agriculture-related programs are identified:

- Improving nutritional objectives, components and considerations in development policies and programmes.
- Improving food security down to the household level.
- Protecting consumers through improved food quality and food safety.

The government has already approved the National Food and Nutrition Policy and the National Plan of Action on Nutrition based on the unanimously adopted resolutions of the conference mentioned above. In this perspective, efforts are being made to increase the production and supply of nutritious crops and thus improve the status of food-based nutrition through implementing nutritional programs in the agriculture sector. These development activities will be continued.

Environmental Protection in Agriculture

Water logging and salinity appear to be severe problems in some parts of the country, including the coastal areas, which not only threaten agricultural activities in those areas but also can cause significant damage to the overall environment. The steps to be taken by the government in this respect are:

- Measures will be taken to resist waterlogging, and the farmers will be motivated to follow appropriate crop rotation and practice crop and fish culture by turns.
- Salt tolerant crop varieties will be developed and extended along with possible measures to resist salinity.
- Considering the environmental hazards associated with implementing crop production policy, necessary steps will be taken to protect the environment in accordance with the approved National Environment and Water Policies.
- Although foreign exchange earnings are largely attributed to shrimp culture in southern saline areas, saline water, together with shrimp disposals in shrimp enclosures and adjacent areas, have been appearing as a source of environmental pollution. In this respect, realistic steps will be taken in light of the already formulated Fisheries Policy.

Women in Agriculture

In Bangladesh's socio-economic context, women's involvement in agriculture is critical. It would be easier to control rural-urban migration by engaging women in agricultural activities to a greater extent. Considering women's involvement in agriculture, the following programs will be taken up to enhance their role under the scope of the National Agriculture Policy:

- In light of the New Agricultural Extension Policy (NAEP), a separate extension programme will be organised for women, as they also participate in the production of field crops.
- An appropriate research programme will be undertaken to identify constraints regarding women's participation in agricultural activities, and measures will be taken to remove those constraints.

Coordination among the Government, NGOs and Private Sector

It is impossible for the government, NGOs, or the private sector alone to solve the whole range of problems or fully explore the prospects of the agriculture sector. Since the problems are complex and widespread in agriculture on the one hand, and the available resource base is minimal on the other, the activities of government, private, farmers and non-government organisations will be coordinated in the following manner for the overall development of agriculture sector:

- Private sector agencies and NGOs will have the opportunity to participate in any programme related to the development of the agriculture sector. However, the government will reserve the right to postpone or ban any activity that is considered to be inconsistent with the National Agriculture Policy.
- Activities of the government, private organisations, and NGOs involved in agricultural development will be brought under a well-organized monitoring system. They will be coordinated from the national to the field level. One agriculture committee will be formed at each national, district, Thana, and union level to consider the issues related to overall agriculture and coordinate the activities of all concerned ministries and agencies involved. The National Agriculture Committee will be formed under the chairmanship of the Hon'ble Minister for Agriculture. Similarly, from the district to union levels, the respective chairman of the local government institutions will be responsible for holding the chair of the agriculture committees at each of the district, Thana and union levels. One farmer's organisation representative will be included as a member of the agriculture committees at each level.

Reliable Database

Successful development program implementation largely depends on the availability of reliable data and information in time. The government will take the following measures under the National Agriculture Policy to build up a reliable database:

- Adequate physical facilities will be created at the district-level DAE offices.
- District-level DAE offices will collect, compile, and preserve all information related to the crop sector through their official channels. For this purpose, adequate computer facilities and skilled human resources will be mobilised.
- Information on agriculture will be preserved and displayed publicly.
- Governments, private sector agencies, and NGOs involved in the agriculture sector will, in principle, agree to exchange information.
- The Bangladesh Bureau of Statistics will organise training programmes on appropriate data collection and preservation methods for the concerned agencies and provide advice in this regard.

Agricultural policy describes a set of laws relating to domestic agriculture and imports of foreign agricultural products. Policies taken between 1990-2020:

| Policy | Major Goals and Policy Thrusts |
|--|---|
| Seed policy, 1993 | Balanced development of public and private sector seed enterprises, simplification of seed necessary for research and commercial purposes, provision of training and technical supports in seed production, processing & storage monitor, control and regulate quality and quantity of seeds. |
| New Agricultural Extension Policy (NAEP), 1996 | <p>The goal of the NAEP is to: “Encourage the various partners and agencies within the National Agricultural Extension System (NAES) to provide efficient and effective services which complement and reinforce each other to increase the efficiency and productivity of agriculture in Bangladesh.”</p> <p>In order to help implement the NAEP, the following committees have been formed (MoA, 1997):</p> <ol style="list-style-type: none"> 1. Extension Policy Implementation Coordinating Committee (EPICC) 2. National Agricultural Technical Coordinating Committee (NATCC) 3. Agricultural Technical Committee (ATC) 4. Research Institute Co-ordination Committee (RICC) 5. District Agricultural Extension Planning Committee (DAEPC) 6. Upazila Agricultural Extension Coordinating Committee (UAECC) 7. DAE/ NGO Liaison Committee |
| Seed Act, 1997 | Description of rules and regulations regarding the shifting functions of the National Seed Board, registration of seed dealers, seed certification, marking truthful labels, and modalities of seed assessment. |

| Policy | Major Goals and Policy Thrusts |
|---|--|
| National Fishery Policy, 1998 | <p>Development of fishery resources, growing fish production and self-employment, meeting demand for animal proteins, accelerating fish exports, and improving public health.</p> <p>Objectives:</p> <ol style="list-style-type: none"> 1. Enhancement of the fisheries production. 2. Poverty alleviation through creating self-employment and improvement of socio-economic conditions of the fishers: 3. Fulfil the demand for animal protein, 4. Achieve economic growth through earning foreign currency by exporting fish and fisheries products; 5. Maintain ecological balance, conserve biodiversity, ensure public health, and provide recreational facilities. <p>Related fisheries policies:</p> <ol style="list-style-type: none"> 1. Establishment of hygienic fish landing centres 2. Transportation and marketing 3. Fish Processing -and Quality-Control 4. Fish Export 5. Educational 6. Policies related to fisheries 7. Fish Training Police 8. Fisheries Extension Program 9. Policy related to Fish research 10. Infrastructure facilities in the fisheries sector 11. Policy related to fisheries environment 12. Fisheries credit policy 13. 13. Policy related to fisheries cooperatives. |
| National Agriculture Policy (NAP), 1999 | <p>Food security, profitable and sustainable production, land productivity and income gains, smooth input supplies, fair output prices, improving credit, marketing, and agro-based industries, and protecting small farmers' interests.</p> <p>Objectives:</p> <p>The overall objective of the National Agriculture Policy is to make the nation self-sufficient in food by increasing the production of all crops, including cereals, and ensuring a dependable food security system for all.</p> |
| Agricultural Extension Manual, 1999 | <p>Yearly crop planning, seasonal extension monitoring, participatory technology expansion and rural approval partnership, technical review, attitude and practice surveys.</p> |
| DAE-Strategic Plan, (1999).- 2002 | <p>Assessment of farmers' information needs, supervision, low or no-cost extension methods, and promotion of food and non-food crops.</p> |

| Policy | Major Goals and Policy Thrusts |
|-------------------------------------|--|
| National Jute Policy, 2002 | Keeping jute production at a desirable level, stabilising supply and prices of jute, developing commercially viable jute industries, accelerating privatisation, and developing multiple uses of jute and jute goods. |
| Plan of Action on NAP, 2003 | Reviewing NAP and its implementation, setting out strategies and actions, and identifying institution and programme framework. |
| Actionable Policy Brief (APB), 2004 | Prioritise immediate, medium-term, and long-term policy measures regarding seed, fertiliser, land, irrigation, mechanisation, marketing, agricultural research, and extension to increase labour and water productivity, investment in agriculture, and risk management. |
| National Agriculture Policy, 2013 | The National Agriculture Policy's principal goal is to promote food and nutrition security for everybody, enhance rural livelihoods through improved crop production with higher productivity, and create employment opportunities through agricultural diversification. The specific goals of this policy are as follows: to provide a sustainable and profitable agricultural production system; Through research and teaching, to develop and spread superior agricultural varieties and sustainable production technologies; Increase production and income while also creating jobs by transferring applicable technologies and improving input management. Promote and sustain agricultural competitiveness through commercialisation: Encourage effective measures to build self-sufficient and sustainable agriculture that is climate change adaptive and sensitive to farmer needs. Ensure fair agricultural commodity prices and improved marketing; Encourage the development of high-quality agricultural products to fulfil the demands of international markets and expand export opportunities. Create opportunities for agricultural product processing and the establishment of agricultural-based companies; and Diversify agriculture to meet people's nutritional needs and encourage the cultivation of more nutritious crops. |

| Policy | Major Goals and Policy Thrusts |
|-----------------------------------|--|
| National Agriculture Policy, 2018 | <p>Main Goal:</p> <p>To achieve safe, profitable agriculture and sustainable food and nutrition security.</p> <p>Main Objective:</p> <p>Ensure food security and improve people's socioeconomic conditions by increasing crop productivity and production, farmer income, crop diversification, nutritious and safe food production, improving the marketing system, and profitable agriculture and efficient utilisation of natural resources.</p> <p>Specific Objectives:</p> <ol style="list-style-type: none"> <li>1. Increase the availability of food, the right to food, and purchasing power by increasing crop productivity and production. <li>2. Modernize agricultural research, education, extension, input management and develop skilled workforce for sustainable technology innovation <li>3. Increase farmers' capability and income through institutional infrastructure development and efficient technology services <li>4. Adopt and implement food production plans to meet the needs of nutritious, safe and demand-driven foods; <li>5. Develop agricultural research for promoting the export of products through coordination with local and international partner organisations <li>6. Assist the farmers in increasing agricultural production, ensuring marketing facilities of agricultural commodities, and obtaining fair prices <li>7. Create a sustainable agricultural production system by increasing productivity through proper management of natural resources <li>8. Reduce the use of physical labour and introduce a cost-saving farming system through farm mechanisation. <li>9. Create new agricultural commercialisation and employment sectors through demand-driven and export-oriented agricultural development. <li>10. Ensure proper use of water resources through active participation in formulating strategies and their proper implementation through inter-ministerial inter-agency coordination. |

| Policy | Major Goals and Policy Thrusts |
|--|--|
| National Agricultural Mechanization Policy, 2020 | <p>Transition to efficient, profitable and commercial agriculture through agricultural mechanisation and ensuring sustainable food and nutrition security:</p> <p>To expedite the use of cost-effective and profitable agricultural machinery at the farmer level, increase productivity by increasing the skills of agricultural labour, and increase the use of mechanical, electrical, and renewable energy in the land to increase crop yield.</p> |

Key Challenges of Agricultural Policies on Agricultural Development

- Institutional weaknesses: A lack of reforms and weak stakeholder collaboration creates an unfavourable environment.
- Policy shortcomings: Poor or absent policies for public-private cooperation limit its potential contribution.
- Extension worker inefficiency: Extension staff may be inadequately trained or diverted from core duties, leading to weak service delivery. Additionally, the limited number of extension workers restricts their reach.
- Infrastructure limitations: A scarcity of extension facilities hinders the dissemination of technologies to farmers.
- Farmer organisation weaknesses: Inoperative or absent farmer groups and cooperatives impede the effective spread of information.
- Feedback and evaluation gaps: The absence of a platform for collecting feedback from extension workers across sectors and a lack of robust monitoring and evaluation systems hinder improvement.

Impact of Agricultural Policies on Agricultural Development

The agriculture industry is critical to Bangladesh's overall economic development. According to the Quarterly Labour Force Survey 2020, the agricultural industry (crops, animal farming, forests, and fishing) produces 14.74 percent of the country's GDP. It employs approximately 41 percent of the labour force (BBS, 2020). Agricultural policies strive to improve agricultural welfare by ensuring agricultural development, raising productivity, enhancing food safety and security, safeguarding and improving natural and biological resources, and building producer organisations. The major influence of agricultural policy on agricultural growth is establishing national self-sufficiency in food production, boosting farm family living standards, conserving agricultural resources, and minimising population pressure in the agricultural sector. The agriculture sector in Bangladesh is divided into four sub-sectors: crop and horticulture, animal farming, forest

and related services. Agriculture's sectoral contribution has been dropping over time, with the service sector capturing the lion's share in the early 1980s. Even though the population has doubled from 70 million to 140 million, agricultural productivity has increased sufficiently to sustain this population. With the rapid rise of the industrial sector, the service sector began to thrive and rose to first place in Bangladesh. Agriculture's proportion shrank as the expansion rate in other sectors outpaced that of agriculture. Dissatisfied with the policy's results, as evidenced by slow economic growth and a continuing difficulty with the balance of payments, and under ongoing donor pressure, Bangladesh launched the first adjustments in its trade and exchange rate policies in the early 1980s. The main trade and exchange rate policy liberalisation also included comprehensive liberalisation of agricultural trade and exchange rate policies and pricing reforms. By the mid-1990s, the distortion in agricultural production pricing on rice and wheat had been nearly eradicated, and total distortions were modest. In response to India's subsidised rice exports in 2001, Bangladesh substantially increased import tariffs on rice. However, domestic aid rates measured relative to international market prices show minor agricultural pricing distortions in Bangladesh in the current decade (Ahmed et al., 2007). Over the previous three and a half decades, Bangladesh's agriculture has undergone substantial structural changes and achieved significant success. Despite several obstacles and limits, a quiet agricultural revolution has occurred, allowing the country to attain national food security through food grain production. Agriculture advances in reaction to various causes, such as natural disasters, socio-political changes, population increase, urbanisation, new technology, opportunities in the rural non-farm sector, and commercialisation. In addition to significantly influencing price incentives in production and consumption, government macroeconomic, trade, and agricultural pricing policies will continue to be important determinants of agricultural growth. Regarding food security, Bangladesh has reaped significant gains from trade liberalisation; for example, private-sector imports have helped stabilise markets following significant production shortfalls. By maintaining near-border pricing for most agricultural commodities, domestic prices have resulted in overall efficiency benefits in the agriculture industry.

Rethinking Food Security: A Critique of Bangladesh's National Agricultural Policy

This section highlights the limitations of the National Agriculture Policy in making the nation self-sufficient in food by increasing the production of all crops in Bangladesh. Here is a breakdown of the critique:

- Declining Sectoral Contribution: While agricultural production sustains

a large population, its share of GDP is shrinking. This indicates a missed opportunity for broader economic development through agriculture. Bangladesh's agricultural sector holds immense potential for generating employment, income, and foreign exchange earnings. However, the policy's focus on achieving self-sufficiency in staple crops may neglect other high-value agricultural products that could contribute significantly to the country's economic growth and diversification.

- **Policy Disconnect:** Despite policy goals of improving farm incomes and resource conservation, the rapid rise of other sectors suggests these aims haven't been fully achieved. The policy framework might not effectively address the challenges faced by smallholder farmers, such as limited access to credit, markets, and technology. This could be hindering their ability to improve productivity and profitability and adopt sustainable practices.
- **Limited Impact of Trade Liberalization:** Trade liberalisation aimed to improve agricultural growth, but its effectiveness requires further exploration. While overall distortions are minimal, the example of rice imports 2001 suggests the policy might not be robust enough to handle external pressures. The policy's impact on agricultural trade needs to be critically evaluated, considering factors such as its influence on domestic production incentives, price stability, and farmers' competitiveness in the global market.
- **Focus on Food Security:** While crucial, the focus on self-sufficiency in staple crops may be overshadowing other aspects of agricultural development. The potential for diversification and higher farm incomes is not fully addressed. The policy could be strengthened by promoting cultivating high-value crops, fruits, vegetables, and livestock, enhancing dietary diversity, improving nutrition, and generating additional income for farmers. Fostering agro-processing industries could add value to agricultural products, create employment opportunities, and contribute to export earnings.
- **Uncertain Role of Policy in Technological Advancement:** This part highlights various drivers of agricultural progress, but the role of policy in fostering technological adoption and innovation remains unclear. The policy framework should actively encourage research and development in agricultural technologies, promote extension services to disseminate knowledge and best practices to farmers and create an enabling environment for private sector investment in agricultural innovation. This could significantly improve agricultural productivity, resource efficiency, and farm incomes.

Overall, this section suggests that while achieving food security, Bangladesh's agricultural policy is hindering the sector's full potential for economic development and diversification.

Conclusion and Recommendations

Various stakeholders, including farmers and rural residents, should be involved in developing and implementing agricultural policies and programs. Agricultural policy and program should also be open and transparent, and they should be set in a context in which agricultural development policy and program are national concerns based on a broad enough consensus to ensure continuity and freedom of expression of individual viewpoints on decisions. The government should encourage robust extension liaison services empowered and supported by adaptive research and mobile people equipped with the required media facilities and information. This will assist in solving the problem of target audience misinterpretation of policy/program objectives, tie their information to and from the research/government, and boost their involvement in the program since they are in closer contact with this audience, ensuring the program's success. Programs should also be monitored and assessed to determine their efficacy regarding a specific geographical impact. This is a very effective method for assessing the direct and indirect impact of multiple programs and projects interacting at the same time. Policymakers/planners should also discover and analyse alternative or different intervention programs in terms of their immediate and long-term impacts, as well as the implications for communities and society as a whole. Bangladesh should embrace the notion of policy/program consistency. This is the simplest method of streamlining, directing, and focusing agricultural development. This idea should be a significant concern in our future policies and programs. The government should create an environment enabling private sector participation in agricultural growth, particularly in processing, preservation, exporting, tourist, recreational, and environmental services. This will boost agricultural development and help us reach out to the rest of the world. From the above discussion, the following recommendations can be proposed for the role of agricultural policies in order to bring sustainable development in Bangladesh:

1. Diversification Strategy:

- Promote high-value crops: Encourage the cultivation of fruits, vegetables, spices, and other high-value crops with strong domestic and export market potential. This can be achieved through subsidies, tax breaks, and technical assistance for farmers transitioning to these crops.
- Support livestock and fisheries: Invest in infrastructure and training programs for improved livestock and fisheries management. This can

increase the population's productivity, income diversification, and nutritional intake.

- Value addition through processing: Support the development of agro-processing industries to add value to agricultural products, reduce post-harvest losses, and create employment opportunities.
2. Empowering Smallholder Farmers:
 - Improve access to credit and markets: Facilitate access to microfinance and other credit options for smallholder farmers to invest in improved technology and inputs. Additionally, invest in infrastructure and marketing channels to connect farmers directly with consumers and reduce exploitation by intermediaries.
 - Technology transfer and extension services: Strengthen agricultural extension services to train and educate farmers on best practices, resource conservation techniques, and adoption of new technologies.
 3. Strengthening Trade Policy:
 - Targeted trade liberalisation: Evaluate the effectiveness of trade liberalisation policies on specific agricultural products. Implement safeguards to protect domestic producers from unfair competition while fostering healthy competition and export opportunities.
 - Focus on price stability and farmer competitiveness: Develop policies that ensure price stability for agricultural products while promoting Bangladeshi farmers' competitiveness in the global market.
 4. Fostering Innovation:
 - Increase investment in agricultural research and development: Increase public and private investments in research on climate-resilient crops, improved crop varieties, and sustainable farming practices.
 - Public-private partnerships: Encourage collaboration between research institutions, universities, and private companies to develop and disseminate innovative agricultural technologies.
 5. Integrating Environmental Sustainability:
 - Promote resource conservation practices: Adopt sustainable agricultural practices such as water conservation techniques, integrated pest management, and soil fertility management. These practices ensure long-term productivity and protect the environment.

Measures needed to take to implement the policies above

1. Extension services for all sorts of farmers: Extension services for better agricultural practices are available to all rural family members, male and female.
2. Efficient extension services: Cost-effective services delivered by well-trained, highly skilled agents are required to answer farmers' difficulties. Cooperation between extension providers and customers will improve cost-effectiveness.
3. Decentralization: Because agricultural conditions and farmer information demands vary by location, extension programs must be determined locally, particularly in remote locations.
4. Demand-led extension: Farmers' issues, needs, and requests will determine the extension agenda. Farmers and extension professionals will use participatory strategies to identify issues that require action.
5. Working with organisations of various kinds: Working with groups allows for more cost-effective use of limited extension resources, increased information sharing, and grassroots decision-making and involvement.
6. Strengthening the extension-research link: Extension and research organisations cannot function alone. Information must flow freely between them to provide a successful service to farmers.
7. Extension personnel training: All extension agents must be confident in their abilities to address farmers' problems, interact with various clients, and communicate with other agencies or persons. Training is required for this purpose.
8. Appropriate extension strategies: No single extension method suits all activities. Extension agents can use farm visits, mass media, training, demonstrations, group meetings, farmer field schools and many other methods.
9. Integrated extension support for farmers: Farmers' advice and information must be based on understanding integrated farming systems. If extension agencies with different areas of expertise are to give whole-farm guidance, they must work together.
10. Coordinated extension activities: Extension services supplied by various agencies must be coordinated at all levels to maximise resource utilisation. This can be accomplished by the entities involved in sharing information and expertise.
11. Integrated environmental support: The NAEP supports extension programs encouraging farmers to apply sustainable and environmentally friendly

- agricultural practices. Efforts should be made to support and learn from farmers and the formal research system.
12. Ensure a profitable and sustainable agricultural production system and raise the purchasing power by increasing the farmers' real income.
 13. Preserve and develop land productivity.
 14. Reduce excessive dependence on any single crop to minimise the risk.
 15. Increase production and supplies of more nutritious food crops, thereby ensuring food security and improving nutritional status.
 16. Preserve existing bio-diversity of different crops.
 17. Take up programmes for the introduction, utilisation and extension of bio-technology.
 18. Take necessary steps to ensure environmental protection as well as 'environment-friendly sustainable agriculture' through increased use of organic manure and strengthening of the Integrated Pest Management (IPM) programme.
 19. Produce and supply of agricultural commodities as required by the industrial sector;
 20. Reduce imports of agricultural commodities and find newer opportunities for increasing exports as well;
 21. Create opportunities for establishing agro-processing and agro-based industries;
 22. Protect the interests of the small, marginal and tenant farmers;
 23. Update the agricultural system in light of the Agreement on Agriculture to protect national interests through the WTO, SAFTA, and other international treaties and develop a contingency management system to combat natural disasters.

By implementing these recommendations, Bangladesh can achieve a more balanced and sustainable agricultural sector that contributes significantly to economic development, food security, and farmer livelihoods.

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Determinants of Perceived Insecurity among Victims of Crime in Bangladesh

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Abstract

Various socioeconomic and demographic factors can influence an individual's perception of insecurity. This paper studies the indicators of the perceptions of insecurity among victims of theft, robbery, burglary and dacoity. This study utilises secondary data from a cross-sectional survey conducted by the Human Development Research Centre (HDRC) in February 2019 for the Police Staff College Bangladesh. The sample consists of 43 police stations and 167 individuals who were victims of the four aforementioned criminal activities. The survey collected qualitative information about their perception of insecurity, demographics and trust in the police and community. The repercussions of facing such situations were also considered, and the respondents were asked about the changes in their levels of distress. The sample is proportionately distributed amid rural and urban areas of Bangladesh based on the crime rates.

When the variables- the estimated value of the lost property and trust in the police- are dropped from the main regression, education level remains significant, and gender becomes weakly significant. Religion is revealed to be a significant determinant of trust in the police for the dissatisfied respondents. Results from the log-linear regression and Standardized Beta regression model indicate education level, trust in the police for the dissatisfied individuals, and the estimated value of the lost property are significant indicators for the perceived insecurity levels of the victims. Household size, age, age squared, religion, marital status, gender, years of residence and relationship with the community appear insignificant. However, past literature indicates the need for further research for more reflective and irrefutable results.

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1. Introduction

The perception of individuals regarding how safe they feel in their community has long been of interest to researchers. When individuals feel safe in their surroundings, they are more likely to have a more optimistic outlook towards others and their lives. It also leads to greater levels of productivity because they tend not to be as consumed by the fear of losing their property, social relationships, or even themselves. Such fear can sometimes be more severe for individuals who were at least once victims of some form of criminal activity.

Crime is one of the various social issues related to our country's economic condition. Theft, burglary, robbery, and dacoity are some of the more common forms of crime that affect the citizens of our country and add a significant financial burden on the victims.

About 21% of our population lives below the national poverty line (Poverty Data: Bangladesh, 2019), and research shows an association of poverty with crime. If an individual is below the line, he faces a lack of choice and might be forced to choose an illegal means of living. Along with the loss in property value, some victims also face psychological damage that cannot be fully measured as no monetary value can be attached to it. Therefore, the full real loss is beyond comprehension.

In a paper prepared by The Canadian Resource Centre for Victims of Crime, it was established that becoming a victim of crime is an unwanted and unpleasant life experience at best. Such experiences throw individuals into a state of shock, apprehension, fear and antagonism. The physical, mental, financial and emotional ramifications of crime can be overwhelming and demoralising to victims. The process of dealing with and recovering from victimisation can be complex. Sadly, the consequences often become so entrenched into one's life that they find themselves in a position where they are incapable of recovering from it.

To conclude how victimisation might affect the individuals of a society, an inspection of the elements of perceived insecurity among the victims is crucial. Hanson et al. (2010), studying the impacts of victimisation on the quality of life, concluded that crime victimisation impacts several factors. The factors included parenting skills, diminished work-related functioning, higher unemployment rates, and greater challenges regarding intimate relationships. However, data on

associations between crime victimisation and overall life satisfaction were mixed, suggesting the need for further investigation.

Rashid (2021) studied the early effect of the COVID-19 lockdown on selected crimes in Dhaka. The concluding results suggested that the observed numbers of total arrests for vehicle thefts and dealings of illegal arms were not significantly different from their predicted values. It was seen that the observed frequency of the total number of arrests for illicit drug trafficking revealed a steep upward trend, which was 75% more than that of the expected frequencies. Such findings, paired with the devastating increase in poverty and the creation of the “new poor” in Bangladesh, which was 24.5 million (14.7% of the total population), should contribute considerably to the perception regarding the insecurity of the public.

It is not only the perceptions of insecurity among Bangladeshis but also the perceptions of the safety of foreigners who travel to Bangladesh for both leisure and business purposes that can come into play in this scenario. Dhaka police revealed that there was an increasing number of criminal gangs who were at large in the city and prompted travellers to be aware of the potential threats of this, which included robbery and other violent criminal offences such as dacoity. Pickpocketing, armed robbery and purse snatching were the more common forms of potential threats. Individuals were recommended not to carry large amounts of money or expensive jewellery. It was found that thieves often work in pairs, so travelling alone was strongly advised against. Passengers using rickshaws or travelling alone in taxis were considered exceptionally vulnerable, especially at night. Use of public transport or rickshaws was advised against, especially if one was to travel alone.

On top of all this, there had been reports of officials misusing their power, and it was often recommended that one keep company with them when going to the police stations. There had been reports of theft and harassment at Dhaka and Sylhet airports. Travellers were further warned about thieves who offered to carry their luggage disguised as porters. Taxis, as well as those serving the airport, often overcharged foreigners and chauffeurs had been known to rob passengers. Warnings were also specified, including passport theft at Dhaka and Sylhet airports. Individuals were instructed to be vigilant and to ensure that their documents and valuables were kept secure at all times. (GOV. UK, n.d.). Such information influences the presumptions and perceptions of foreigners when it comes to the security status of Bangladesh. Needless to say, to improve both the perceptions regarding our citizens' security and our country's representation to the outside world, we must first thoroughly study the perceptions of the general people and accordingly put appropriate policies in effect.

This paper examines the determinants of perceptions of insecurity among the victims of theft, burglary, robbery and dacoity in Bangladesh. We will be checking

the extent of the effects and signs of the variables. Furthermore, we inspect factors determining the individuals' trust in the police system and how the value of property lost as a result of being a victim of the aforementioned criminal activities may be affected by the demographic variables used in the study. We find education level, trust in the police for the dissatisfied individuals, and the estimated value of lost property to be significant indicators of perceived insecurity.

2. Review of Literature

Several studies have been conducted regarding the perceptions of the general public when it comes to their safety. Islam et al. (2020), checking the efficiency of the Bangladeshi police, found that the colonial attitudes which came with the introduction of the police system by the British influenced the current behaviour of the police of this country. This makes the system difficult to trust and affects people's perceptions of societal safety. For the system to be deemed a pro-people one, a paradigmatic shift is needed, including a reduction in political influence and a revision of the Police Act 1861 since it does not match many of the needs of today's people.

In another study devoted to examining the confidence in the police with their performance by Ren et al. (2005), age was found to be a significant factor. With age, trust in the police rose, meaning the positive perceptions of safety also ascended. Neilson and Smyth (2008), in their paper regarding the perceptions of public safety and the outlook on migrants among China's urban population, found that for the cities that spent more on armed police per capita, the citizens were more likely to be satisfied with the existing public safety procedures. Age, gender, and size of the household all appeared insignificant.

According to Soto et al. (2021), in their study relating public transportation to fear of crime in Colombia, fear of crime was found to be negatively associated with the perception of security, and the strongest predictor of fear of crime was gender. The findings implied that women who used public transportation on a daily basis experienced greater fear of crime when at the bus stop, and women who experienced sexual harassment had a greater fear of the buses. Fear stemming from such experiences could translate to a fear of all crimes in general. A paper by Köseoglu (2021) regarding the safety perceptions of Turkish and Turkish Cypriot university students revealed that female students experienced a greater fear of crime than male students.

Baba and Austin (1989) found that connections with the community may also influence an individual's perceived safety levels. Their findings revealed that improvements in the quality of neighbourhoods generally lead to an enhanced perceived level of safety. Even though fear of crime is a complex issue, this result

suggested that the relationship with the community might be an important variable to consider when examining the factors affecting fear of crime.

Shields et al. (2008) studied the determinants of perceived safety among older adults aged 65 years and above in an intensely rural country of Northwest Ohio. Only education had a significant impact on perceived levels of safety. Age appeared insignificant. 71% of the respondents said they felt “very safe” in their neighbourhood; however, this could also be attributable to the lower actual levels of victimisation in the area under study.

Tucker-Seeley et al. (2009) found that older adults (ages 50-75 years) who perceived their neighbourhoods as safe had an 8% higher mean rate of leisure-time physical activity, i.e. LTPA, than older adults who perceived their neighbourhoods as unsafe. However, the association was no longer significant when the respondent’s mental, biological, social and functional aspects, including individual and cultural beliefs and health behaviours, were added. The findings suggest that over and above the influence of socioeconomic and demographic characteristics and functional limitations, perceived neighbourhood safety can impact the level of physical activity among older adults, indicating that fear of crime can be a potential barrier to health. Level of education and household wealth were found to be highly significant, with educational attainment and perceived safety being negatively related and household wealth and perceived safety being positively related. Mullen et al. (1985) found that the perceptions of safety increased with the trust of neighbours. Age also affected perceived safety, and as age increased, the perceived levels of safety of the respondents decreased.

Marital status is a crucial factor to consider when examining the determinants of perceived safety. Neilson and Smyth (2008) expected married people to perceive public safety more favourably and found it to be significant in its relationship with perceptions of public safety. However, Tucker-Seeley et al. (2009) found it to be insignificant. Braungart et al. (2012) had findings that suggested fear of crime to be especially dominant among the ones in the population who are the most vulnerable and isolated. Notably, the elderly and middle-aged women of colour, the unmarried older women who lived alone, the older women with health issues, and women of all ages who had faced burglary were more fearful. Toseland (1982) found that marital status, age, gender and the household size of the respondent were the main variables that influenced the difference between fearful and non-fearful respondents.

Religion is similarly a critical factor of interest when it comes to an individual’s perceptions of safety. Barka (2006) analysed three different case studies to see if some people were innocent but discriminated against due to their religious beliefs, traditions and practices. He concluded that according to the

indications by FBI data, hate crimes/ bias-motivated crimes seemed to be on the rise in the United States, and it seemed unlikely to decline due to the existence of diversity in terms of race, ethnicity and religion. However, Gale et al. (2002), when exploring determinants of hate crime, found religion to be insignificant.

When studying Muslim men and women's perceptions regarding hate crimes, discrimination and Post-Traumatic Stress Disorder, i.e. PTSD symptoms following the events of 9/11 in New York, Abu-Ras and Suarez (2009) found "feeling less safe" to be significant (at 5% level of significance) in the prediction of PTSD. Men and women seemed to differ in symptoms, with men appearing more likely to face racial harassment, and women seemed more likely to express fear of being in public places.

The data used in this paper is relatively rare and unexplored and reveals much about the perceptions of Bangladeshi victims of theft, robbery, burglary and dacoity. Victims of crime are an important subgroup of the general public of any country. They should be given primary importance when evaluating safety/ security levels and differences in perceptions. In the context of a country like Bangladesh, where criminal activity is one of the major concerns of policymakers, and the prime causes of crime include poverty, drugs, politics, and unemployment, it is crucial to keep the perceived safety levels of the people in check. Checking such perception/ worry levels would benefit policymakers and help reform old policies and build and implement new ones.

3. Methodology

3.1 The Data

The data source for this paper is drawn from a study conducted by the Human Development Research Centre (HDRC) in February 2019 for the Police Staff College Bangladesh (Barkat et al., 2019). The cross-sectional study consists of 43 police stations and 167 victims. Individuals surveyed were victims of four forms of criminal activities: theft, robbery, burglary and dacoity. They were inquired about their demographics and trust in the police and community. The repercussions of facing such a crime were also considered when the respondents were asked about the changes in their level of distress. The sample is proportionately distributed amid rural and urban areas of Bangladesh based on the crime rates.

3.2 Limitations

In the equation shown in the estimation section, ε represents all the variables that affect the perceptions of insecurity of the respondents but are not included in the equation due to unavailability. For example, the growth rate of each area under inspection is not considered, which is an important variable to include as areas with

fewer people moving in/out may reveal residents to have a lower fear of crime. Even though the estimated value of the lost property is present as an explanatory variable, ϵ also includes household wealth and income, which can be related to perceptions of insecurity as an individual with a greater level of household wealth and income may be less psychologically and/or financially affected by a loss in their property than someone who has limited income and wealth. Another plausible limitation of this study is that respondents may be unwilling to give accurate information to the interviewers due to their decision-making abilities, say in their household matters or political influences in the respective areas under study. Such exclusion of important factors could lead to model misspecification. Another point to note is that the survey consists of 167 victims, which is a fairly small size and may not be a suitable representation of the entire population of Bangladesh. In addition to these limitations, some other possible shortfalls of this study may include:

- I. Perceptions of non-victims/victims' family members were not considered.
- II. Victims of criminal offences such as rape, cybercrime, domestic violence, and child abuse were not considered.
- III. The sample's age range is 18 to 75; perhaps a wider age range would be more appropriate.
- IV. The survey data were collected in 2019 and might not entirely reflect the post-COVID-19 scenario.
- V. Income level is related to an individual's social class. The ability to afford an education is positively associated with higher income levels. Therefore, if income levels were considered, perhaps the significance of the individual's education level would have differed. So, the exclusion of income level may cause omitted variable bias.

Such limitations indicate the scope for further research in this area.

3.3 Estimation

This study aims to identify the crucial factors that affect the perception of insecurity for victims of various types of property crimes. For this purpose, we estimate the following regression model:

$$\log WI = \beta_0 + \beta_1 educ + \beta_2 hhsiz + \beta_3 age + \beta_4 age_sq + \beta_5 yrs_res + \beta_6 religion + \beta_7 gender + \beta_8 marital_stat + \beta_9 comm_relation + \beta_{10} value_crime + \beta_{11} trust_pol + \epsilon$$

The log of the dependent variable is taken to allow for interpretations in terms of percentage changes. We will also be analysing the Standardized Beta Regression coefficients as an additional method for interpretation following this. Let us first study the nature of the dependent and independent variables included in this study, which are tabulated below.

Descriptive statistics of dependent and independent variables

| Variable | Mean | Standard deviation | Minimum value | Maximum value |
|--|----------|--------------------|---------------|---------------|
| <i>WI</i> (Worry Index) | 1.403 | 0.690 | 0 | 3 |
| Education level | 9.186 | 5.234 | 0 | 16 |
| Household size | 4.419 | 1.592 | 1 | 10 |
| Age | 41.934 | 12.447 | 18 | 75 |
| Age squared | 1912.461 | 1135.531 | 324 | 5625 |
| Years of residence | 23.916 | 17.545 | 0 | 70 |
| Religion | 0.156 | 0.364 | 0 | 1 |
| Gender | 0.108 | 0.311 | 0 | 1 |
| Marital status | 0.096 | 0.295 | 0 | 1 |
| Relationship with community | 0.168 | 0.375 | 0 | 1 |
| Estimated value of property lost (BDT) | 44386.23 | 40039.52 | 2500 | 150000 |
| Trust in police | 1.479 | 0.684 | 0 | 2 |
| Total number of observations= 167 | | | | |

Dependent variable

The variable *WI* is the Worry Index, which is the dependent variable of this study. It is generated by considering how worried the victims are about facing theft, burglary, robbery and/or dacoity again and their perceived insecurity levels after dark (specifically for staying home alone or walking alone outside after dark). The questions asked were:

a. How worried are you about being a victim of a crime like theft, burglary, robbery, and dacoity?

b. How safe do you feel, or how safe would you feel walking alone in this area after dark?

c. How safe do you feel, or how safe would you feel staying alone at home during the night in this area?

The scores for these answers can be 0, 1, 2, or 3, where 0 = feeling very safe, 1 = feeling fairly safe, 2 = feeling a bit unsafe, and 3 = feeling very unsafe. The index is obtained by averaging the respondents' scores for these three questions and can range from 0 to 3. The mean of this index is about 1.40, which is almost halfway between feeling fairly safe and a bit unsafe but leans more towards feeling fairly safe.

Independent variables

The independent variables included in this study are the respondents' education level, household size, age, age squared, years of residence, religion, gender, marital status, relationship with the community, the estimated value of stolen property and satisfaction with the current police system of Bangladesh.

The variable *educ* in the equation indicates the individual's level of education, which ranges from 0 (no formal education received) to 16 years of schooling (equivalent to a complete bachelor's degree). The mean years of education were found to be about nine years (equivalent to being in the eighth grade). Household size is indicated by *hhsz*, which in this survey ranges from 0 to 10 members, with the mean household size being about four members per household. The respondent's age is indicated simply by *age* ranging from 18 to 75, with an average age of 42. As mentioned in the literature review section, in a study dedicated to examining the confidence in the police with their performance by Ren et al. (2005), age was found to be a significant factor where with age, trust in the police rises, reflecting that the perceptions of insecurity lessen with age. However, Mullen et al. (1985) found that with an increase in age, the perceived levels of insecurity of the respondent increase. Intuitively, with an increase in age, the perception of insecurity may decrease for apparent reasons. However, as people age, these perceptions about insecurity may increase after a certain period. This is because the elderly are generally more vulnerable to criminal activities. This indicates the need to include the square of age- *age_sq* as an additional explanatory variable for the study.

The number of years of residence indicated by *yrs_res* in the equation shows the years the respondents lived in the respective areas. It ranges from 0 to 70 years with a mean of 24 years of residency. Religion, gender, and marital status are dummy variables indicated by *religion*, *gender* and *marital_stat*, respectively. The religion dummy takes a value of 1 if the respondent is non-Muslim (which is either Hindu or Buddhist in this study) and 0 if Muslim. In this study, only about 16% of the sample were non-Muslim, and the rest were Muslim. Gender dummy, *gender* takes the value 1 if the individual is female and 0 if male. About 11% of the sample were female, and the rest were male. Marital status is expressed using *marital_stat*, where *marital_stat* takes the value 1 if the individual is married and 0 otherwise (which is either never married or widowed). Almost 10% of the respondents were married, and the rest were not. Relationship with the community, as seen from the respondent's perspective, is also a dummy variable indicated by *comm_relation*, which takes a value of 1 if the relationship is fair/not good and 0 otherwise, i.e. if the relationship is good. About 17% of the respondents show a fair/not good bond, and 83% of them display a good connection with the community.

The variable *value_crime* indicates the estimated value of property lost from being a victim of theft, robbery, burglary and dacoity. It ranges from 2500 BDT to 150000 BDT with a mean of about 44386 BDT. Lastly, the individual's satisfaction with the police system/ trust in the police is indicated by the categorical variable *trust_pol*, which takes a value of 0 if the individual is neither satisfied nor dissatisfied, i.e. they are indifferent, 1 if they are not satisfied and 2 if they are satisfied. In this connection, it should be mentioned that approximately 11% were indifferent, 30% were unsatisfied, and 59% were satisfied with the police system.

Multicollinearity problems may arise between some of the explanatory variables. For example, education level and gender could be correlated as women, especially in rural areas, are discriminated against regarding educational opportunities. Education level and household size could also be correlated as knowledge about birth control influences the number of children parents have. Furthermore, educated women tend to spend a larger proportion of their lives in school or work and have a greater opportunity cost of bearing and caring for children. The estimated value of the lost property can be correlated with trust in the police. The police may not pay as much attention to a respondent who lost TK 2500 as they would to someone who lost TK 150000, which is common knowledge amongst individuals. Education level and the relationship with the community may also be correlated as an individual who is more educated in understanding and communication may have a different perception about their society and thus have a different relationship with their community compared to a less educated individual. Age and education level may also be correlated. Table 1 in the Appendix indicates the correlation between the independent variables of this study. Some of the interesting correlations have been discussed below.

Age and Years of residence are seen to be positively related and have a correlation value of 0.279. Household size and Years of residence are also positively related, with a correlation value of 0.225. Education level and Household size are negatively associated with a correlation value of -0.124, perhaps (as mentioned before) because more educated respondents tend to be more cautious about contraceptive use/ birth control and care more about the 'quality', not the 'quantity' of their offspring. Relationship with community and education level is negatively correlated with a value of -0.179, indicating that a more educated individual has a less favourable relationship with the community. Gender and years of residence are negatively related, as shown by a correlation value of -0.251; this could be attributable to the fact that a Bangladeshi woman generally tends to reside where her husband's or father's occupational posting is. Age and age-squared are highly positively correlated, as shown by a correlation value of 0.989; since this is not a linear relationship, it is not an issue of multicollinearity.

Correlation between the variables mentioned above (other than Age and Age squared) may be some possible causes of multicollinearity. However, the simple rule of thumb- the absolute value of correlation no more than 0.7- indicates that there is no severe multicollinearity problem that needs to be accounted for. This is supported by Table 2 in the Appendix, where calculations of Variance Inflation Factors (VIF) and the Tolerance values (1/VIF) are presented (the rule of thumb being severe multicollinearity present if VIF exceeds 10 and if Tolerance is below 0.25). The values of VIF and Tolerance for Age and Age squared indicate multicollinearity as the associated VIFs are too high, and Tolerance values are too low. However, dropping Age squared from the variables, Table 3 (in Appendix) reveals that the source of such values was the correlation between age and age squared. So, it is acceptable to assume that there is no severe multicollinearity problem.

4. Analysis

4.1 The Findings

Referring to the equation mentioned in the methodology section, the results of this regression are tabulated in Table 4 of the Appendix. The significant variables are education level, the estimated value of lost property and trust in the police of the individuals in question.

Education level is found to be significant at a 5% level of significance with an estimated value of the coefficient of -0.01, indicating that with a one-year increase in education level, the perceived level of insecurity falls by about 1%. The estimated value of the lost property is highly significant at a 1% level of significance. The value 2.080×10^{-6} indicates that with each extra taka lost due to being a victim of crime, the perceived level of insecurity increases by about 0.000208%. It could perhaps be attributable to the fact that individuals with lower income levels and less secure jobs, such as small business owners like street side shop vendors or rickshaw pullers, are hurt more from facing any loss in income/ savings from being a victim of crime than someone with a more secure source of income and higher earnings.

Trust in police is a categorical variable with 0, 1 or 2 values. As mentioned in the methodology section, 0 indicates indifference regarding trust, 1 indicates that the respondent appears dissatisfied with the police system, and 2 indicates that the individual is satisfied with the police. In Table 4 (in Appendix), val2 is taken to be the base for this variable. Here, trust in police appears significant at a 5% level of significance for individuals who are dissatisfied with the policing system compared to ones who are satisfied. Dissatisfied individuals have a 13.5% higher perception of insecurity than the satisfied respondents. Such a conclusion is also supported by Islam et al. (2020), who- as mentioned in the literature review

section- believed the police system of Bangladesh not to be as people-friendly as is desirable by the general public and expressed this fact itself to be one of the causes of the inefficiency in the policing system of Bangladesh.

Moving on to the implications of the Standardized Beta Regression model, Table 5 shows the results from this estimation method. It appears that the same variables are still significant, and the directions of the association are also similar. The Standardised Beta coefficient associated with education level indicates that a one standard deviation increase in education level decreases the log of worry index by 0.177 standard deviations. Education level is still significant at a 5% level of significance. The estimated value of lost property is significant at a 1% level of significance as it previously was, and the Standardised Beta coefficient implies that with a one standard deviation increase in the estimated value of lost property, the log of worry index increases by 0.269 standard deviations. Trust in the police is still significant at a 5% level of significance for dissatisfied individuals.

Turning our attention to some of the unusually insignificant variables- gender, religion, marital status and household size- which seem odd to appear insignificant for the reasons to be discussed. For a patriarchal country like ours, discrimination based on gender is an issue of interest. It could be a possible distinguishing factor when it comes to differences in the levels of insecurity of the victims. Akhter et al. (2017), in the study surrounding the effects of gender and health of the women employed in the ready-made garments (RMG) sector, revealed that they lacked appropriate childcare services, which increased the working mothers' anxiety, stress levels, agitation and suicidal tendencies. This intensified even more due to the double work burden, separation from their children, and lack of family support. The findings of King et al. (2021) suggested that due to the inability to choose safe transport, Bangladeshi women attempted to alleviate risks by changing their travel patterns and manners and limiting their travel frequencies. The women expressed that they faced a variety of different criminal offences, including gender-based violence, traffic injuries and harassment. However, Malik and Hasan (2016) found that the fear of stigma keeps women from reporting any crime in the first place. In most cases, their abusers turn out to be family members, which is a possible reason why gender appears insignificant even though it likely is not.

Shoji (2017) established that Bangladeshi households in religiously fractionalised communities are more likely to be victims after a natural disaster in comparison to households in non-fractionalised communities. This study further exhibited empirical support for the idea that the misassignment of disaster relief in fractionalised communities drives the result. Sultana and Subedi (2015), in their study concerning Bangladeshi Hindu sweepers, discussed that they had been historically discriminated against and were deprived of choices such as free

selection of profession, access to housing, proper schooling and other such benefits. Their paper also suggests that such treatment of an individual was attributable to the historical, colonial, economic, political and social aspects of caste-based discrimination. Such marginalisation in terms of religion should undoubtedly affect an individual's perceptions of insecurity.

Marital status is a crucial determinant of perceptions of insecurity, especially in rural Bangladesh. Women face dowry-related violence from both their families and their spouses. Naved and Persson (2005) revealed that in both rural and urban residential areas, dowry or other demands in matrimony and a history of abuse of the husband's mother by her spouse increased the risk of violence. Again, as in the case of gender abuse, the women may not report such criminal activities as the abusers are their household members. However, suppose a married respondent does not face such behind-closed-doors abuse. In that case, they are likelier to have a lower perception of insecurity than an unmarried individual. If one believes in strength in numbers, the greater the household size, the lower the perception of insecurity. This suggests that household size should have been a significant determinant of fear of crime. However, this idea might be strictly conditional on the age and gender dynamics of the household members and the political affiliation of the respondent.

4.2 Robustness checks

To check if there are any changes in the significance of determinants if WI (Worry Index) was used as the dependent variable rather than log WI, Table 6 has been included in our study. The results indicate that the same variables are still significant, and the levels of significance for each of the three variables- education level, the estimated value of the lost property, and trust in the police for the dissatisfied individuals- are 5%, 1% and 1%, respectively. However, Gender, which previously had a p-value of 0.214 and 0.203, now has a p-value of 0.148, which is approximately 0.1 if taken at one decimal place, i.e. significant at a 10% level of significance.

If the variables- the estimated value of the lost property and trust in the police- are dropped from the original regression, Table 7 reveals that education level remains significant at a 5% level of significance. Gender appears significant at a 10% level of significance, where the estimated coefficient of 0.142 implies that females have a 14.2% higher perception of insecurity than male respondents.

It might be interesting to study the relationship between the demographic variables (i.e. all but Trust in police) and the estimated value of lost property. Regressing the estimated value of lost property on all demographic variables in Table 8 reveals that education is no longer significant. Gender again appears weakly

significant (again, a p-value of 0.113 is approximately 0.1 if taken at one decimal place or significant at an 11% level of significance) with an estimated coefficient of 15758.3, implying that the female respondents have on average TK 15758.3 greater loss in terms of the estimated value of lost property than their male counterparts.

To check if trust in police is affected by any demographic variables (all but the Estimated value of lost property), Table 9 presents the results from the logistic regression of trust in police on all demographic variables. Redefining the variable trust in police to examine its determinants for the dissatisfied individuals- trust in police takes a value of 1 if the individual is dissatisfied with the policing system and 0 otherwise, i.e. if the respondent is satisfied or indifferent about the policing system. Religion is found to be significant at a 5% level of significance. The estimated value of the coefficient is -1.971, which indicates that non-Muslims are less dissatisfied with the policing system than Muslim respondents. The odds of the non-Muslim respondents being dissatisfied with the police is 0.139 less than that of the Muslim respondents. It seems unusual, given that past findings reveal the opposite. However, this could be one of the consequences of a small sample size or the fact that in such a Muslim-dominated country, non-Muslims may have a lower expectation from the police in the first place as they are aware of the existing marginalisation based on religion.

5. Conclusion

In conclusion, education level, trust in the police for the dissatisfied individuals, and the estimated value of lost property appear to be significant indicators of perceived insecurity. Household size, age, age squared, religion, marital status, gender, years of residence and relationship with the community appear insignificant. When the variables- the estimated value of the lost property and trust in the police- are dropped from the regression, education level remains significant, and gender becomes weakly significant. Religion is revealed to be a significant determinant of the dissatisfied respondents' trust in the police. However, these results may not be entirely conclusive as the sample selection may not have been random. Some possible policy recommendations based on the results obtained include:

- I. Making education more accessible to all people. This requires better infrastructure and access to electricity. Underdeveloped roads and no appropriate transportation modes may make education attainment strenuous. The lack of electricity also means limited access to media. So, policies made to improve infrastructure and provide electricity can positively impact education as more energy and time can be available for educational attainment and attendance, which, in turn, could affect the individual's perception of insecurity.

- II. Another crucial factor to keep in mind is that the quality of education should be assigned as a high priority. Such ‘quality education’ should include a better attitude towards the individuals in addition to good books or a better/ more comfortable environment for studying.
- III. Female and male students should not be discriminated against based on gender, and female students having the same rights as their male counterparts should be one of the primary concerns of the curriculum. This can be achieved through teaching young, impressionable boys and girls about gender inequality and workplace discrimination. The policymakers are to focus their attention towards more anti-discriminatory policies to minimise discrimination based on gender as well as those based on religion, race, ethnicity and social class.
- IV. To improve the citizens’ trust in the police system, it needs to be ensured that the behaviour of the police towards the victims reflects that the steps being taken are in the best interest of the victims. To make the police system more effective and fair, it is necessary to implement policies which focus on lowering biases (based on religion, gender, race, class and politics) and aggression of the police towards the victims. Appropriate performance and psych evaluations should be implemented, and the police should be monitored consistently.
- V. Some individuals become totally distressed due to crime-related property loss. In such cases, it might be appropriate to consider institutionalising the social insurance system to compensate for such losses. Such a social insurance system may be an integral part of the national social protection (safety net) programme.
- VI. Mental and emotional health services, as well as medical health services, should be made more accessible for both the victims and their family members. Psychological trauma has been found to be linked to certain serious illnesses. Therefore, the availability of services that help victims deal with their experiences should unquestionably be a critical concern for policymakers.

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Appendix

Table 1: Correlation Matrix

| | Estimated value of lost property | Age | Marital status | Years of residence | Religion | Education level | Household size | Relationship with community | Gender | Trust in police | Age squared |
|----------------------------------|----------------------------------|--------|----------------|--------------------|----------|-----------------|----------------|-----------------------------|--------|-----------------|-------------|
| Estimated value of lost property | 1 | | | | | | | | | | |
| Age | 0.155 | 1 | | | | | | | | | |
| Marital status | 0.003 | -0.172 | 1 | | | | | | | | |
| Years of residence | 0.0387 | 0.279 | -0.017 | 1 | | | | | | | |
| Religion | -0.072 | 0.037 | 0.029 | 0.133 | 1 | | | | | | |
| Education level | 0.032 | -0.025 | -0.101 | -0.145 | -0.037 | 1 | | | | | |
| Household size | 0.007 | -0.047 | -0.035 | 0.225 | -0.082 | -0.124 | 1 | | | | |
| Relationship with community | -0.008 | -0.040 | 0.072 | 0.008 | -0.060 | -0.179 | 0.023 | 1 | | | |
| Gender | 0.116 | -0.004 | 0.149 | -0.251 | -0.096 | -0.086 | -0.104 | 0.051 | 1 | | |
| Trust in police | 0.015 | 0.082 | 0.099 | 0.087 | 0.183 | -0.067 | 0.119 | -0.057 | -0.103 | 1 | |
| Age squared | 0.152 | 0.989 | -0.127 | 0.261 | 0.018 | -0.041 | -0.057 | -0.033 | -0.012 | 0.069 | 1 |

Table 2: Variance Inflation Factors (VIF) and Tolerance values (1/VIF)

| Variable | VIF | 1/VIF |
|--|--------|-------|
| Education level | 1.140 | 0.878 |
| Household size | 1.130 | 0.887 |
| Age | 53.610 | 0.019 |
| Age squared | 51.990 | 0.019 |
| Years of residence | 1.320 | 0.760 |
| Religion | 1.130 | 0.882 |
| Gender | 1.200 | 0.832 |
| Marital status | 1.220 | 0.819 |
| Relationship with community | 1.050 | 0.954 |
| Estimated value of lost property (BDT) | 1.070 | 0.939 |
| Trust in police | | |
| 0 | 1.160 | 0.866 |
| 1 | 1.170 | 0.853 |
| Mean VIF | 9.760 | |

Table 3: Variance Inflation Factors (VIF) and Tolerance values (1/VIF) with Age squared dropped

| Variable | VIF | 1/VIF |
|--|-------|-------|
| Education level | 1.120 | 0.892 |
| Household size | 1.120 | 0.890 |
| Age | 1.190 | 0.843 |
| Years of residence | 1.290 | 0.774 |
| Religion | 1.110 | 0.897 |
| Gender | 1.170 | 0.858 |
| Marital status | 1.100 | 0.913 |
| Relationship with the community | 1.050 | 0.954 |
| Estimated value of lost property (BDT) | 1.060 | 0.939 |
| Trust in police | | |
| 0 | 1.150 | 0.873 |
| 1 | 1.170 | 0.857 |
| Mean VIF | 1.140 | |

Table 4: Regression of Log of Worry Index on all explanatory variables

| Log of Worry Index (logWI) | Estimated coefficient | T value | P>t |
|--|--|---------|-------|
| Education level | -0.010** (0.005) | -2.280 | 0.024 |
| Household size | -0.010 (0.017) | -0.580 | 0.563 |
| Age | 0.008 (0.015) | 0.550 | 0.586 |
| Age squared | -0.0001 (0.0002) | -0.660 | 0.508 |
| Years of residence | -0.0002 (0.001) | -0.150 | 0.883 |
| Religion | -0.0004 (0.069) | -0.010 | 0.995 |
| Gender | 0.101 (0.081) | 1.250 | 0.214 |
| Marital status | 0.011 (0.067) | 0.180 | 0.857 |
| Relationship with community | 0.056 (0.064) | 0.880 | 0.382 |
| Estimated value of lost property (BDT) | 2.080×10^{-6} *** (6.1×10^{-6}) | 3.410 | 0.001 |
| Trust in police | | | |
| 0 | 0.086 (0.066) | 1.310 | 0.193 |
| 1 | 0.135** (0.051) | 2.620 | 0.010 |
| Constant | 0.674 (0.342) | 1.970 | 0.051 |

Note: (i) Robust standard errors in parentheses; (ii) p values less than 0.01, 0.05 and 0.1 denote significance at 1%, 5% and 10% levels of significance and are shown as ***, ** and *, respectively

Table 5: Standardized Beta Regression Estimation

| Log of Worry Index (logWI) | Estimated coefficient | T value | P>t | Beta |
|--|---|---------|-------|---------|
| Education level | -0.010** (0.005) | -2.270 | 0.024 | -0.177 |
| Household size | -0.010 (0.015) | -0.670 | 0.503 | -0.052 |
| Age | 0.008 (0.013) | 0.640 | 0.525 | 0.339 |
| Age squared | -0.0001 (0.0001) | -0.780 | 0.435 | -0.410 |
| Years of residence | -0.0002 (0.001) | -0.140 | 0.888 | -0.012 |
| Religion | -0.0004 (0.066) | -0.010 | 0.995 | -0.0005 |
| Gender | 0.089 (0.079) | 1.280 | 0.203 | 0.102 |
| Marital status | 0.012 (0.084) | 0.140 | 0.887 | 0.011 |
| Relationship with community | 0.056 (0.061) | 0.910 | 0.365 | 0.068 |
| Estimated value of lost property (BDT) | 2.08X10 ⁻⁶ *** (5.80x10 ⁻⁷) | 3.580 | 0.000 | 0.269 |
| Trust in police | | | | |
| 0 | 0.086 (0.078) | 1.100 | 0.271 | 0.086 |
| 1 | 0.135** (0.053) | 2.550 | 0.012 | 0.201 |
| Constant | 0.834 (0.287) | 2.310 | 0.022 | |

Note: (i) Standard errors in parentheses; (ii) p values less than 0.01, 0.05 and 0.1 denote significance at 1%, 5% and 10% levels of significance and are shown as ***, ** and *, respectively

Table 6: Regression of Worry Index on all explanatory variables

| Worry Index (WI.) | Estimated coefficient | T value | P>t |
|--|---|---------|-------|
| Education level | -0.022** (0.010) | -2.150 | 0.033 |
| Household size | -0.010 (0.037) | -0.260 | 0.792 |
| Age | 0.012 (0.035) | 0.350 | 0.726 |
| Age squared | -0.0002 (0.0004) | -0.400 | 0.688 |
| Years of residence | -0.001 (0.003) | -0.480 | 0.633 |
| Religion | 0.039 (0.155) | 0.250 | 0.800 |
| Gender | 0.262 (0.193) | 1.350 | 0.148 |
| Marital status | -0.022 (0.164) | -0.130 | 0.893 |
| Relationship with community | 0.141 (0.140) | 1.000 | 0.318 |
| Estimated value of lost property (BDT) | $5.27 \times 10^{-6}***$ (1.44×10^{-6}) | 3.650 | 0.000 |
| Trust in police | | | |
| 0 | 0.197 (0.147) | 1.340 | 0.183 |
| 1 | 0.317*** (0.118) | 2.690 | 0.008 |
| Constant | 1.063 (0.757) | 1.400 | 0.162 |

Note: (i) Robust standard errors in parentheses; (ii) p values less than 0.01, 0.05 and 0.1 denote significance at 1%, 5% and 10% levels of significance and are shown as ***, ** and *, respectively

Table 7: Regression of Log of Worry Index on all explanatory variables (except the estimated value of property and Trust in police)

| Log of Worry Index (log WI) | Estimated coefficient | T value | P>t |
|------------------------------|--------------------------------------|---------|-------|
| Education | -0.010** (4.71X10 ⁻³) | -2.130 | 0.035 |
| Household size | -0.014 (0.019) | -0.770 | 0.443 |
| Age | 0.007 (0.017) | 0.410 | 0.683 |
| Age squared | -8.5X10 ⁻⁵ (0.0002) | -0.460 | 0.647 |
| Years of residence | 0.0003 (0.002) | 0.190 | 0.853 |
| Religion | -0.056 (0.073) | -0.760 | 0.447 |
| Gender | 0.142* (0.079) | 1.790 | 0.076 |
| Marital status | -0.013 (0.066) | -0.200 | 0.846 |
| Relationship with community | 0.066 (0.062) | 1.080 | 0.282 |
| Constant | 0.842 (0.354) | 2.380 | 0.019 |

Note: (i) Robust standard errors in parentheses; (ii) p values less than 0.01, 0.05 and 0.1 denote significance at 1%, 5% and 10% levels of significance and are shown as ***, ** and *, respectively

Table 8: Regression of Estimated value of lost property on all demographic variables

| Estimated value of lost property (BDT) | Estimated coefficient | T value | P>t |
|--|-----------------------|---------|-------|
| Education level | 397.796 (593.094) | 0.670 | 0.503 |
| Household size | 502.236 (1815.600) | 0.280 | 0.782 |
| Age | 662.128 (1955.730) | 0.340 | 0.735 |
| Age squared | -1.854 (22.487) | -0.080 | 0.934 |
| Years of residence | 83.106 (195.298) | 0.430 | 0.671 |

| Estimated value of lost property (BDT) | Estimated coefficient | T value | P>t |
|--|-------------------------|---------|-------|
| Religion | -7610.300 (8236.433) | -0.920 | 0.357 |
| Gender | 15758.300 (9880.194) | 1.590 | 0.113 |
| Marital status | 2991.790 (8917.735) | 0.340 | 0.738 |
| Relationship with community | -499.000 (7440.000) | -0.070 | 0.947 |

Note: (i) Robust standard errors in parentheses; (ii) p values less than 0.01, 0.05 and 0.1 denote significance at 1%, 5% and 10% levels of significance and are shown as ***, ** and *, respectively

Table 9: Logistic regression of Trust in police on the demographic variables

| Trust in police | Odds Ratio | Estimated coefficient | Z value | P>z |
|---------------------------------|------------|-----------------------|---------|-------|
| Education level | 0.959 | -0.042 (0.034) | -1.200 | 0.229 |
| Household size | 0.858 | -0.154 (0.102) | -1.290 | 0.196 |
| Age | 0.953 | -0.048 (0.096) | -0.470 | 0.636 |
| Age squared | 1.001 | 0.001 (0.001) | 0.500 | 0.614 |
| Years of residence | 1.013 | 0.013 (0.011) | 1.150 | 0.249 |
| Religion | 0.139 | -1.971** (0.108) | -2.540 | 0.011 |
| Gender | 0.832 | -0.184 (0.514) | -0.300 | 0.765 |
| Marital status | 0.443 | -0.815 (0.321) | -1.120 | 0.261 |
| Relationship with the community | 1.397 | 0.334 (0.649) | 0.720 | 0.472 |
| Constant | 3.039 | 1.111 (6.659) | 0.510 | 0.612 |

Note: (i) Robust standard errors in parentheses; (ii) p values less than 0.01, 0.05 and 0.1 denote significance at 1%, 5% and 10% levels of significance and are shown as ***, ** and *, respectively

Entitlement Failures in Pakistan (1950-1971): A Tale of Disparity and Struggle for Justice

Ahmed Javed Chowdhury*

All knowledge is knowledge through concepts. - Socrates¹

Abstract

The 1971 genocide in Pakistan, resulting in the extermination of Bengalis, is a stark example of entitlement failure—where the state failed to protect its people’s rights and well-being. This essay explores economist Amartya Sen’s entitlement concept, which combines economics and political science to analyse this tragedy. Entitlement is about the resources available to individuals and households in a nation for a dignified life, emphasising the state’s role in upholding legal norms and empowering citizens. It includes primary (like education and health) and secondary entitlements (property rights and political participation), impacting social and economic disparities. The East-West disparity in Pakistan originated in 1947, with most Bengali Muslims supporting its creation. However, the dominance of non-Bengali Muslims and the imposition of Urdu as the sole national language led to discontent. Entitlement failure was evident in unequal resource allocation, favouring West Pakistan. The under-representation of Bengalis worsened the divide. Geographical separation, about 1200 miles apart, exacerbated this disconnection. Professor Nurul Islam’s 1950s observations highlighted East Pakistan’s slow development and inadequate investment. Foreign aid favoured the West, leaving East Pakistan

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economically deprived; disparities extended to job placements, government spending, and basic commodity costs. In conclusion, entitlement failures in primary and secondary entitlements fuelled discontent among Bengalis. This inequality culminated in the 1971 War of Liberation, leading to Bangladesh's independence. It underscores the importance of equitable resource allocation and protecting entitlements for a just society.

Historical analyses, particularly those concerning Bangladesh, often fall into two distinct categories: the superstructure and the base structure. The superstructure encompasses many factors, including language, culture, identity, violence, colonial experiences, values, norms, policy matters, and political decisions. In contrast, the base structure delves into economic aspects such as disparities, exploitation, wealth redistribution, GDP, per capita income, and the ability to afford essentials for a decent life. However, the reality we face is far more intricate, with these two threads intricately woven together. In this forthcoming paper, I have made a concerted effort to integrate both facets of life seamlessly. I firmly believe that attempting to segregate these structures is an exercise in futility, as they are inherently interconnected. To achieve this holistic perspective, I have adopted Amartya Sen's entitlement approach as the guiding framework for my analysis. Through this approach, I aim to provide a comprehensive examination that not only bridges the gap between the superstructure and the base structure but also underscores their interdependence. I aim to present a unified understanding of these vital aspects of life, enriching our comprehension of Bangladesh's historical narrative.

The Entitlement Approach

The genocide that occurred in Pakistan in early 1971, which resulted in the widespread extermination of Bengalis, can be viewed as an entitlement failure, a tragic manifestation of the profound failure to ensure the rights and well-being of its people. This catastrophic event can be further understood through the insightful perspective of the visionary economist and philosopher Amartya Sen, who introduces the concept of entitlement. Sen's framework draws upon the convergence of two crucial branches of social science, namely economics and political science, to elucidate the complex dynamics at play.

As elucidated by Sen, Entitlement is the total of a nation's resources that empowers a household to secure and sustain life and liberty by accessing essential goods, services, and amenities. This notion underscores the imperative role of a state in not just upholding legal norms and practices but also in facilitating its citizens with the practical means to lead dignified lives within these parameters. It is an individual's entitlement that represents the array of diverse commodity combinations attainable through legitimate channels of acquisition available to

someone in their particular circumstances. Sen articulates this concept by stating, “The entitlement of a person stands for the different alternative commodity bundles that the person can acquire through the use of the various legal channels of acquirement open to someone in his position. In a private ownership market economy, the entitlement set of a person is determined by his original bundle of ownership (what is called his [or her] ‘endowment’) and the various alternative bundles he can acquire starting respectively from each initial endowment, through the use of trade and production (what is called his ‘exchange entitlement mapping’).”²

Amartya Sen contributed significantly to our understanding of entitlements. According to Sen, an entitlement is an individual’s claim to a set of resources, goods, or services. It is important to note that entitlements are not necessarily based on legal rights but on social norms and expectations. Sen’s concept of entitlement is rooted in the idea of freedom, particularly the notion that individuals should have the freedom to pursue their own goals and aspirations. He argues that entitlements are essential to exercising this freedom, as they provide individuals with the necessary resources to pursue their goals.

Sen distinguishes between two types of entitlements: primary and secondary. Primary entitlements are those that are directly related to an individual’s abilities, such as education, health, and nutrition. Secondary entitlements, on the other hand, are those that are related to an individual’s position in society, such as property rights, political rights, and social status. Sen argues that a society’s distribution of entitlements can have significant implications for its overall well-being and development. For example, if a society fails to provide basic education and health care to all of its citizens, it may limit their ability to participate fully in the economy and society, leading to social and economic inequality. This was precisely what happened in East Pakistan, partly due to the rulers of West Pakistan. Overall, Sen’s concept of entitlement emphasises the importance of ensuring that all individuals have access to the resources they need to pursue their goals and live fulfilling lives. By focusing on the distribution of entitlements, we can work towards creating a more just and equitable society.

Moreover, he has categorised four types of entitlement relations in his book *Poverty and Famines: An Essay on Entitlement and Deprivation*, published four decades ago, in the early 80s of the last century. He explains:

“Entitlement relations accepted in a private ownership market economy typically include the following, among others: (1) trade-based entitlement: one is entitled to own what one obtains by trading something one owns with a willing party

2 Dreze, J., Sen, A. & Hussain, A. (Eds.). (1995). *The Political Economy of Hunger: Selected Essays (WIDER Studies in Development Economics)*. (pp. 52-53). Oxford University Press.

(or, multilaterally, with a willing set of parties); (2) production-based entitlement, one is entitled to own what one gets by arranging production using one's owned resources, or resources hired from willing parties meeting the agreed conditions of trade; (3) own-labour entitlement: one is entitled to one's labour power, and thus to the trade-based and production-based entitlements related to one's labor power; (4) inheritance and transfer entitlement: one is entitled to own what is willingly given to one by another who legitimately owns it, possibly to take effect after the latter's death (if so specified by him)."³

In essence, Sen's concept of entitlement offers a profound lens through which we can analyse the tragic events of the Bengali genocide in 1971, emphasising the failure of the state to safeguard the entitlements of its people. This perspective highlights the critical importance of not just legal structures but also the practical empowerment of individuals and communities to lead secure and prosperous lives within the boundaries of a just and compassionate society. Regrettably, the state of Pakistan found itself unable to uphold equity and justice between its two distinct regions, namely the Eastern and Western parts. In addition to this, it imposed a heavy burden of state-centered injustices upon the Eastern region.

An Overview of Bengali Identity Formation

The root cause of disparity-based Pakistani policy-making occurred nearly eight decades ago. One of the highly regarded historians, A. F. Salahuddin Ahmed, traces this in this way, "During British rule, the great majority of the Muslims of India came under the spell of separatist Muslim nationalism for a variety of reasons. They seem to believe that their community's special interests and aspirations would be fulfilled if they could establish their own, separate state. This was the prime idea behind the Pakistan movement."⁴ Over time, we would not be able to find a sustainable state which is based on religious nationalism. The visionary poet-novelist Rabindranath Tagore showed this in his outstanding novel *Gora*. The protagonist of the novel, Gora, wants to be a 'pure Hindu' after a quite long journey of consciousness while interacting with his family and friends, constantly updates himself through social conscience and intellectual awareness from lower to upper stem, and finally reaches the culmination at the end of the novel: "'Mother, you are my mother!' exclaimed Gora. 'The mother whom I have been wondering about

3 Sen, A. (1999). Chapter 1: Poverty and Entitlements [Print]. In *Poverty and Famines: An Essay on Entitlement and Deprivation* (pp. 1–8). Oxford University Press (Oxford India Paperbacks). (Original work published 1981)

4 Ahmed, A. F. (2022). Introduction: Bangladesh History and Culture: An Overview [Print]. In A. F. Ahmed, B. M. Chowdhury, A. Khan, A. M. Chowdhury, & S. M. Shahed (Eds.), *An Introductory Reader: Bangladesh National Culture and Heritage*. ISBN 978 984 506 273 2 (2nd ed., pp. 4–5). The University Press Limited (UPL), Dhaka, Bangladesh.

in search of was all the time sitting in my room at home. You have no caste, you make no distinctions, and have no hatred- you are only the image of our welfare! It is you who are India!”⁵

What Rabindranath emphasised is that a country or a specific geographical boundary does not belong to any particular religion or ethnic community. Instead, it is a place of multi-religious and multi-ethnic communities that would maintain a harmonious relationship across groups and live peacefully. Unfortunately, cognitive development lagged, and superfluous opinion generators won over immature consciousness. This consciousness sprouts from the upper class of the Muslim society, which comprises non-Bengali Muslims and consists of migrants: Punjabis and Urdu-speaking people who came from India, particularly from Uttar Pradesh and Bihar.⁶ However, it is a fact that the Bengali Muslim community holds more than half of the Muslim population of India, who are primarily outspoken people. This Bengali Muslim cohort was a supporter of embarking on Pakistan from the Indian sub-continent with a different expectation from that of Punjabi and Urdu people. Moreover, caste prejudices, anti-Muslim sentiments, and communal attitudes of middle and upper-class Hindu *bhadralok* resulted in disharmony and conflicts in society. This counteractive effect on Muslims could be translated as anti-Hindu feelings.

What constituted the deep-rooted process of Bengali national identity formation was explained by historian Salahuddin Ahmed: “Compared to many modern nation-states, Bangladesh is young- but it is home to an old civilization. Geography and history have marked Bengal as a distinct region and Bengali-speaking people as a distinct community. This distinctness has been recognized since long ago.”⁷ Bengal has drawn invaders and immigrants from different parts of the world since ancient times because of its smooth river connectivity, unlike Africa, where lands and mountains disjoined waterways. Rabindranath himself emphasised this in his poems, song lyrics, and essays, including the aesthetic aspect. Before Tagore, the significance of the role of rivers in boosting trade and commerce was vigorously articulated by the father of modern economics, Adam Smith (1723- 1790). Amartya Sen explains, “The analysis of Adam Smith on the place of rivers in the development of the market economy. Smith saw Bengal in

5 *Gora : Rabindranath Tagore : Free download, Borrow, and streaming : Internet Archive.* (1949). Internet Archive. <https://archive.org/details/in.ernet.dli.2015.351175/page/n417/mode/2up?view=theater>

6 Ahmed, A. F. (2022). Introduction: Bangladesh History and Culture: An Overview [Print]. In A. F. Ahmed, B. M. Chowdhury, A. Khan, A. M. Chowdhury, & S. M. Shahed (Eds.), *An Introductory Reader: Bangladesh National Culture and Heritage*. ISBN 978 984 506 273 2 (2nd ed., p. 5). The University Press Limited (UPL), Dhaka, Bangladesh.

7 *Ibid*, p. 1.

the eighteenth century as very prosperous economically, which he linked not only to the skills of locally trained workers but also (very much) to the opportunities arising from rivers and navigation.”⁸ For instance, Smith pointed out the role of navigational opportunities that contributed to flourishing civilisations: Baltic and Adriatic seas in Europe, the Mediterranean and Euxine seas in both Europe and Asia, gulphs of Arabia, Persia, India, Bengal, and Siam in Asia,⁹ etc. Smith further extended his line of thoughts of explaining the Nile in the civilisation of northern Africa as a general pattern but pointed out the backwardness of Africa the absence of navigational opportunities: “the great rivers of Africa are at too great a distance from one another to give occasion to any considerable inland navigation.”¹⁰

This geographical pattern allows the Bengal mind to amalgamate with distant civilisations and facilitate a hybrid, flexible, and inclusive identity that non-Bengalis generally do not have. Salahuddin Ahmed contends, “It is generally believed that Islam came to Bengal long before the Muslim conquest of the region in the thirteenth century. Some Arab Muslim traders who had arrived in Bengal around the eighth and ninth centuries are believed to have established settlements in the coastal regions of Bengal, particularly in the areas of present-day Noakhali and Chittagong.”¹¹ He further adds that “It is commonly known that the inhabitants of Bengal have sprung from diverse racial backgrounds, including proto-Australoid, Mongoloid, Dravidian, Aryan, Arab, and Turko-Afghan. Besides these, another element came from East Africa. For several years, Bengal was ruled by a series of five or six Abyssinian Sultans, and there was also a practice of keeping Abyssinian guards for royal palaces. Traces of Abyssinian descent are still noticeable in the facial features of Bengali Hindus and Muslims.”¹²

From ancient to the present, Bengal was a mix of several human settlements of different clans such as “Banga or Vanga, Gauda, Pundra, or Rarha.”¹³ Bengal’s identity and psyche have always been a composite culture of harmonious co-existence, from the Vaishnava bhakti cult of Shri Chaitanya (1338-1553), Muslim Sufi saints to the translation of Mahabharata and Bhagavad Gita from Sanskrit to

8 Sen, A. (2021, July). The Rivers of Bengal [Print]. In *Home in the World: A Memoir* (p. 25). Allen Lane, an imprint of Penguin Books, Penguin Random House, UK. <https://doi.org/10.1080/00207233.2022.2043117>

9 *ibid.*

10 *ibid.* p. 26

11 Ahmed, A. F. (2022). Introduction: Bangladesh History and Culture: An Overview [Print]. In A. F. Ahmed, B. M. Chowdhury, A. Khan, A. M. Chowdhury, & S. M. Shahed (Eds.), *An Introductory Reader: Bangladesh National Culture and Heritage*. ISBN 978 984 506 273 2 (2nd ed., p. 2). The University Press Limited (UPL), Dhaka, Bangladesh.

12 *ibid.* p. 3.

13 *ibid.*

Bengali under Muslim Sultans. Therefore, the cultural heritage consists of three sources: “(a) the pre-Aryan and Hindu-Buddhist elements; (b) Islamic elements; and Western or European elements. Each has been inextricably woven into the cultural fabric of the region, contributing to its many-sided splendor.”¹⁴

Unravelling the Language Movement through the Lens of Entitlement Discourse

Two seemingly different identities, on the one hand, historically constitute the inclusive self of Bengali Muslims, and the less-flexible exclusive Punjabi-Urdu psyche came into confrontation immediately after the creation of Pakistan since non-Bengali Muslims captured the power and started to dominate Bengali Muslims. The birth of Pakistan would not be possible without the support of the majority Bengali Muslims. As a result of this, since the expectations of Bengali Muslims were not fulfilled, they began to worry about their future since they did not find much sign of fair treatment by the minority Panjabi-Urdu speaking community who perceived themselves as Ashraf (superior class). The composition of the population according to different languages was as follows: 1. Pashto: 7%, Balochi: 1.4%, 3. Sindhi: 5.8%, Punjabi: 28.4%, Anglo-Indian: 1.8%, Urdu: 7.2%, 7. Bangla: 54.6%.¹⁵

On 21st March 1948, in his convocation speech at Dhaka University, M. A. Jinnah, the founder of Pakistan and the first Governor-General, declared that “‘Urdu and Urdu alone’ would be the language of the state of Pakistan.”¹⁶ Moreover, he warned the large crowd at the Dhaka Race Course field: “He [Jinnah] sounded a warning against what he called the forces of subversion and conspiracy bent on destroying the unity of Pakistan.”¹⁷ This disrespectful speech ignited historic language movements led by Dhaka University students and staff and other conscious youths. Some months later, in the same year, on December 10, the United Nations (UN) adopted The Universal Declaration of Human Rights (UDHR), where Article 2 explicitly expresses that every human being is entitled to language as the fundamental element, including other rights and freedoms.¹⁸ This may be the first entitlement failure of Pakistan’s citizens caused by the violation of language rights initiated by the central policy maker. It is also proof of the assertion of the exclusive Ashraf identity of the Urdu-speaking group.

14 *ibid.* p. 4.

15 Hossain, K. (2013, December 1). *Bangladesh: Quest for Freedom and Justice*. (pp. 6-9). Oxford University Press, USA.

16 Ahsan, S. B. (2020, March 4). When Mr Jinnah came to Dhaka. *Dhaka Tribune*. <https://www.dhakatribune.com/opinion/op-ed/202933/when-mr-jinnah-came-to-dhaka>

17 *ibid.*

18 United Nations. (10 December 1948). *Universal Declaration of Human Rights* | United Nations. <https://www.un.org/en/about-us/universal-declaration-of-human-rights>

Entitlement failure occurs when the fundamental rights of freedom of speech for individuals or communities are obstructed by the state's policy decisions, thereby preventing the alleviation of illiteracy. This is ultimately related to better job opportunities, which enhance one's capability and help reduce group inequality. It is worth considering whether employing an entitlement approach to address a historical event is already settled in the annals of history and offers any additional benefits. History, after all, remains open to interpretation. The endeavour to re-examine the underlying causes of the historic language movement, which ultimately gave birth to an independent nation, Bangladesh, is undertaken with a fresh perspective. Moreover, my perspective does not solely emphasise an exclusive new approach rooted in entitlement. Instead, I posit that it may complement other nationalist discourses that examine the language movement. By delving into the essence of the language movement, we may gain a deeper understanding of the sacrifices made, including bloodshed and loss of lives, in the pursuit of language rights.

The entitlement approach offers a distinct advantage over conventional analyses regarding shaping language rights within a state's central policy framework. It holds the promise of enabling less populous language-based groups to assert their rights. Besides the movements and other activism, Dhirendranath Datta stands out as the trailblazing advocate who championed the recognition of Bengali, complete with its traditional script, as an official state language in the Pakistan assembly.¹⁹ In today's global landscape, we are confronted with the existence of a staggering 7,106²⁰ living languages, alongside the somber fact that 573²¹ languages have already vanished from human discourse, with only a handful successfully revived. This underscores the profound impact of language movements, both historical and contemporary, in contributing to the enrichment and diversification of our world.

Entitlement Failures and Deprivations in East Pakistan

In the opening chapter of *A Theory of Justice*, John Rawls posed a breakthrough in the history of thoughts. He writes: "Justice is the first virtue of social institutions, as truth is of systems of thought."²² In explaining what justice is in his highly regarded book *A Theory of Justice*, published in the same year of 7th March Speech

19 Dhirendranath Datta's proposal. (2023). In *Bengali Language Movement*. Retrieved September 17, 2023, from https://en.wikipedia.org/wiki/Bengali_language_movement

20 Lingua. (2022, July 29). How many languages are there in the world? | *Lingua.edu*. <https://lingua.edu/how-many-languages-are-there-in-the-world/>

21 Sichel, B., & Sichel, B. (2019, November 6). Understanding extinct languages: when and why they die off - ILS Translations. *ILS Translations - Technical Translation Services*. <https://www.ilstranslations.com/blog/understanding-extinct-languages-when-and-why-they-die-off/>

22 Rawls, John. (1999). 1. The Role of Justice: Chapter I. Justice As Fairness [Print]. In *A Theory of Justice* (Revised, p. 3). The Belknap Press of Harvard University Press. (Original work published 1971)

and our great war of liberation when we embarked as an independent state, 1971, Rawls wrote:

“Each person possesses an inviolability founded on justice that even the welfare of society as a whole cannot override. For this reason, justice denies that the loss of freedom for some is made right by a greater good shared by others. It does not allow that the sacrifices imposed on a few are outweighed by the larger sum of advantages enjoyed by many. Therefore, in a just society, the liberties of equal citizenship are taken settled; the rights secured by justice are not subject to political bargaining or to the calculus of social interests. The only thing that permits us to acquiesce in an erroneous theory is the lack of a better one; analogously, an injustice is tolerable only when it is necessary to avoid an even greater injustice. Being the first virtues of human activities, truth and justice are uncompromising.”²³

Bangabandhu Sheikh Mujibur Rahman, the visionary politician, the founder of independent Bangladesh, the biggest influence on the lives of Bangladeshis, the most admired person in Bengal, Father of the Nation, and the first signatory of the Bangladesh Constitution in 1972, told in his historic “7th March Speech” (translated by Fakrul Alam) that,

“I’ve met President Yahya Khan. I’ve made a request to him not only on behalf of Bengal but also as the leader of the party which has the majority in Pakistan: I said to him: “You must hold the session of the National Assembly on 15 January.” But he did not listen to me. He listened to Mr. Bhutto instead. At first, he said that the meeting would take place in the first week of March. We said, “Fine, we will be taking our seats in the Assembly then.” I said we will carry out our discussions in the Assembly. I went so far as to say that if anyone came up with an offer that was just, even though we were in the majority, we would agree to that offer.”²⁴

Clearly, Bangabandhu’s idea of justice resembles Rawls’s theory of justice. Therefore, in reality, our foundations of justice are not only based on the essence of collective political struggle but are backed by philosophical ideas of justice. The Constitution Drafting Committee was formed on April 11, 1972, and Dr. Kamal Hossain was appointed as the Chairman of the committee by Bangabandhu. Among the prominent members were Barrister Amir-Ul Islam, Advocate Suranjit Sengupta, and Razia Banu, the only female member. Dr. Kamal Hossain wrote:

“During the four decades, people lost power, often through violent interventions, resulting in controversial changes made in the Constitution. We can, however, proudly

23 Rawls, John. (1999). 1. The Role of Justice: Chapter I. Justice As Fairness [Print]. In *A Theory of Justice* (Revised, pp. 3–4). The Belknap Press of Harvard University Press. (Original work published 1971)

24 7th March Speech. (2015). [Print]. In Shamsuzzaman Khan (Ed.), & Fakrul Alam (Trans.), *Bangabandhur Sat-E Marcher Bhashan: Bahumatrīk Bishlashan (The 7th March Speech: An Extensive Analysis)* (pp. 213–216). Bangla Academy. (Original work published 1971)

say that people steadfastly struggled to uphold the fundamentals of the Constitution, as adopted in 1972. We, thus, have the opportunity today to assess the extent to which the goals of the Constitution have been realized.”²⁵

Kamal Hossain pointed out that the win would ultimately go to people who are the sources of all power. They safeguarded the fundamental principles and rights that they achieved while fighting against so many mighty powers that did not last long. In his profound work, *Making of A Nation Bangladesh: An Economist Tale*, Professor Nurul Islam (1929-2023), the first Deputy Chairman of Bangabandhu’s Planning Commission, artfully captures the sentiments of the early 1950s in East Pakistan. He paints a vivid picture of growing discontent stemming from a glaring disparity in development and investment between East and West Pakistan. While the western region was experiencing rapid progress in all facets of national life, the eastern region found itself mired in a quagmire of slow development. He explains:

“By the early 1950s, dissatisfaction was building up in East Pakistan about slow development and inadequate investment in contrast to rapid progress in West [Pakistan] in all areas of national life. The unhappiness was fuelled by the fact that the bulk of foreign exchange resources of East [Pakistan] were used for the development of the West. Also, there were great concerns frequently expressed in the press and on the political platform about the persistent and wide gap in the representation of East in all the branches of the policymaking machinery and administration.”²⁶

The disheartening reality further fuelled this discontentment that the major share of East Pakistan’s foreign exchange reserves was siphoned off for developing the western part of the country. Additionally, a prevailing sense of unease echoed through the press. It resonated on political platforms, highlighting the persistent and gaping chasm in East Pakistan’s representation across all branches of the policymaking apparatus and administrative echelons. Nurul Islam astutely underscores how Pakistan’s state policies, less than three years after its separation from the Indian Sub-continent in the latter part of 1947, failed to uphold principles of equity and instead exhibited a discernible bias favouring the western provinces. These injustices imposed upon the Bengalis gave rise to a sotto voce hum of discontent in social interactions, as the material deprivations

25 Hossain, Dr. K. (2020, February). Our constitution, the goals of independence and four decades of experience [Print]. In A. Javed (Ed.), *Bangladesher Sangbidhan: Nana Prosonga* (Bangladesh Constitution and Its Different Aspects) (pp. 57–63). Anyapokash (ISBN: 978 984 502 599 7).

26 Islam (Economist), N. (2013). Chapter 2: Concept of Two Economies: First Encounter with the Pakistani Establishment [Print]. In *Making of A Nation Bangladesh: An Economist Tale* (3rd ed., p. 23). The University Press Limited (UPL). (Original work published 2003)

endured by the populace inevitably left their mark on human behaviour and collective consciousness. Significantly, it's crucial to note that there were no direct water connections between East and West Pakistan, effectively placing them at a staggering distance of approximately 1200 miles apart.

In his book, *From Two Economies to Two Nations: My Journey to Bangladesh*, Professor Rehman Sobhan (1935-), one of the most outspoken members of Bangabandhu's Planning Commission, states:

“The idea of two economies located within the nation-state of Pakistan was conceptualized through the writings of several Bengali economists. ... The indivisibility of the national economy as a postulate may imply one of two things. First, that the economy is indivisible in an organic sense. The term indivisibility, however, has certain forbidding connections which provide ample meat for a philosophical feast. ... we mean that there is one economy in Pakistan and not two. We can then examine the question of whether, in fact, there are one or two economies in Pakistan.”²⁷

In the following table, the ever-growing disparity becomes vibrant

| SL No. | Particulars of Disparity | East Pakistan (Bangladesh) | West Pakistan |
|--------|---------------------------------|----------------------------|-----------------|
| 1. | Government Expenditure | 1500 Crore Taka | 5000 Crore Taka |
| 2. | Development Expenditure | 3000 Crore Taka | 6000 Crore Taka |
| 3. | Foreign Aid | 20% | 80% |
| 4. | Import | 25% | 75% |
| 5. | Job placements in Central Govt. | 15% | 85% |
| 6. | Job placement in the Military | 10% | 90% |
| 7. | Rice/40Kg=1 Mon | 50 Taka | 25 Taka |
| 8. | Flour/40Kg=1 Mon | 30 Taka | 15 Taka |
| 9. | Master Oil/Kg | 5 Taka | 2.50 Taka |
| 10. | Gold/Bhori | 170 Taka | 135 Taka |

Source: *Liberation War Museum*²⁸

27 Sobhan, P. (2016). Part I: Two Economies; 1.1 the Indivisibility of the National Economy of Pakistan [Print]. In *From Two Economies to Two Nations: My Journey to Bangladesh* (2nd ed., pp. 1–3). The Daily Star Books. (Original work published 2014)

28 *The General Election of 1970 Historical Poster of Awami League* (By Liberation War Museum). (1969). [Print]. Gallery-1, Agargaon, Dhaka-1207, Civic Centre, Plot: F11/A & F11/B, Bangladesh.

In summary, the entrenchment of entitlement failures extended to both primary and secondary entitlements. Pakistan's central policymakers conspicuously lacked a genuine commitment to the well-being of their eastern counterpart. Deliberate efforts were made to strip the people of East Pakistan of essential primary goods, and concurrently, they were denied equitable social positions and rights, effectively diminishing both individual and collective freedoms. Ultimately, this culmination of injustices and disparities precipitated the War of Liberation, leading to the fracturing of East Pakistan from the rest of the country and the birth of Bangladesh as a sovereign and independent nation.

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Dinajpur's Macroeconomic Landscape: Navigating Opportunities and Challenges

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Abstract

This study analyses Dinajpur's macroeconomic landscape, elucidating the diverse opportunities and challenges that characterise its agriculture, industry, and services sectors. The study finds that the agriculture, industry, and services sectors have significant potential for growth and development but are hindered by various challenges, such as a lack of infrastructure and insufficient investment. Additionally, the paper explores poverty, inequality, and employment issues and argues that addressing these challenges is crucial for sustainable and inclusive economic growth in Dinajpur. The paper concludes with recommendations for policymakers to improve the macroeconomic environment and support the agriculture, industry, and services sectors, which could, in turn, create more jobs and reduce poverty and inequality in the region.

Keywords: *Dinajpur · Agriculture · Industry · Services · Poverty · Inequality · Employment · Economy*

1. Introduction

Dinajpur is a district located in the northern part of Bangladesh. The district has a diverse economy, with agriculture, industry, and services all playing essential roles. This growth has been driven primarily by the agricultural sector, which

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employs most of the population and contributes significantly to GDP. The industrial and service sectors have also been growing, albeit slower. Our country's development pace is not parallel to the Dinajpur district as it is the second-highest and poorest district. The macroeconomic picture of Bangladesh reveals that the country's economy grew strongly over ten years, surpassing milestones of 7.0 percent in FY 2015–16 and 8.0 percent in FY 2018–19. The COVID-19 pandemic, however, caused the growth rate to drop to 3.45% in FY 2019–20. In FY 2020–21, the economy expanded by 6.94 percent. BBS's preliminary projections show that the GDP grew by 7.25 percent in the fiscal years 2021–22. The contribution of the service and industrial sectors increased the national GDP, where agriculture is the main dominant sector in this district (*Bangladesh-Economic-Review-2022*). No primary agri-based industry or significant service sector is established here. This district's 63.90% of the population's total income comes from agriculture ("Wikipedia," 2023). Even though a few mega projects are going to be completed shortly. However, before taking the development program, we need to have a comprehensive idea about the economy of Dinajpur.

This paper provides an analysis of Dinajpur's macroeconomic scenario, focusing on the opportunities and challenges facing the agriculture, industry, and services sectors. This is followed by an analysis of the macroeconomy, focusing on the factors that impact its growth and development. The research then explores issues relating to employment, inequality, and poverty, examining how these affect Dinajpur's macroeconomic environment.

The paper concludes with a series of targeted policy recommendations to enhance the region's macroeconomic environment and support the growth and development of the agriculture industry and services sector. These recommendations are intended to generate gainful employment, reduce poverty and inequality, and promote sustainable economic growth in Dinajpur.

Overall, this study contributes to the understanding of the macroeconomic landscape in Dinajpur and highlights the need for further research to fully understand the complex economic dynamics at play in the region. This study ends with the hope that it provides a foundation for policymakers to develop effective policies and programs to support economic growth and development in the area.

2. Data and Methodology

This study on the macroeconomic landscape of Dinajpur is based on secondary data sources, particularly newspapers and other relevant publications. A comprehensive review of the available literature was conducted to gather information about the economic landscape in Dinajpur, focusing on the agriculture industry and services sectors. The study employed a descriptive approach to analyse the data, which

involved examining and summarising the available information systematically and structured. But one thing must be mentioned: no previous study has been conducted about the macroeconomic scenario of Dinajpur. Most of the studies about Dinajpur are related to the agriculture sector.

The data collection process involved identifying and reviewing relevant newspapers and publications that provided information on the macroeconomic scenario in Dinajpur. Articles, reports, and other relevant materials were reviewed, and relevant information was extracted and compiled. The data was then analysed to identify patterns, trends, and other pertinent information related to agriculture, industry, and services.

The limitations of this study include the potential for bias and incompleteness in the secondary data sources used. Nonetheless, the study provides valuable insights for further research to understand the economic landscape in the region entirely.

3. Macroeconomic Landscape of Dinajpur

I. Agricultural Sector

The agricultural sector is a vital component of the Dinajpur district's economy, as it is the primary source of employment and income for a significant portion of the population. The district's fertile land, moderate climate, and abundant water resources make it ideal for agricultural production. The major crops grown in the Dinajpur district include rice, wheat, maize, potato, onion, garlic, tomato, and other vegetables. The district is also known for producing high-quality mangoes and lychees. Most of the people in this district are involved in the agricultural sector. The total number of Farmers in this district is 329393 (male 320429, female 8964)(*Krishi Batayon*, 2022). More classified data is given below:

| Farmers' category | Number |
|-------------------|--------|
| Uncategorised | 248855 |
| landless | 17555 |
| Marginal | 13656 |
| Small | 35469 |
| Average | 8507 |
| Big | 5351 |

Source: Krishi Batayon, 2022

According to Dinajpur's Department of Agricultural Extension (DAE), the district has around 2.79 lakh hectares of arable land. Local farmers cultivate Boro paddy on 1.74 lakh hectares, Aman on 2.60 lakh hectares, Aush on 11,000 hectares, potato on 43,000 hectares, and wheat on 5,500 hectares. More than 6.24 lakh families in the northern district are involved in agriculture, and they have surplus food grains even after feeding 35 lakh Dinajpur people. (*Department of Agricultural Extension (DAE) of Dinajpur*, 2022). The following table depicts the food production scenario of the Dinajpur district.

| Food-related information | Production |
|--|---------------------|
| The total amount of food production | 1437394 Metric. ton |
| The total food demand | 487015 Metric. ton |
| The total food deficit amounts | 0 Metric. ton |
| The total amount of food surplus | 841865 Metric. ton |
| The total amount of seeds, fodder, and other wastage | 49020 Metric. ton |
| Percentage of grain density | 3084 % |

Source: *Krishi Batayon*, 2022

Dinajpur district is unrivalled in the production of fragrant rice. Different varieties of aromatic rice are grown in this district. Among them, Bridhan-34, Katari, Jira Katari (powdered sugar), Philippine Katari, Challisajira, Badsha Bhog, Black cumin, Jata Katari, Chini Katari, Begun Bichi, and Bridhan-50 are notable. The area under cultivation is about 40765 hectares, and the total rice production is about 85406 million tons. The cultivation of high-yielding, fragrant Biri Dhan-70' has been started to bring back Kataribhog paddy cultivation under the supervision of the DAE. (Dinajpur District, 2022)

Not only rice but also Litchi are prominent agricultural products in this district. According to the Dinajpur Horticulture Center, the district has 4,500 litchi gardens in a total of 5,500 hectares of land. On average, 4000 litchis per tree (in a year), the total yield is 22,000,000. Litchi was cultivated on 5 thousand 610 hectares of land in the Dinajpur district last year (DAE). (*Department of Agricultural Extension of Dinajpur*, 2022)

In addition to rice and litchi, livestock also plays a significant role in the agriculture industry in this district. The information below gives an overview of animals. (*District Livestock Office*, 2020)

1. Dinajpur district has consistently achieved self-sufficiency in meat production (2,35,717 MT 2019-20).

2. Self-sufficient in egg production (42,11,78,215 eggs in 2019-20).
3. Milk production has been 195097 metric tons.
4. 10897 private dairy farms have increased continuously.
5. The number of cattle has increased. Currently, the number of cows in the district is 17, 19,663 out of which 2,99,132 are advanced breed cows. The number of goats and sheep is 11, 20,000.
6. Poultry farms have increased. At present, the number of poultry farms is 2150.
7. The number of small and large private goat farms is 1835.
8. 775 private duck farms.
9. Cultivation of improved varieties of grass has increased at a significant rate. At present, the amount of land under grass cultivation is 750 acres.

Besides crops, Dinajpur also has surplus seeds. Dinajpur annually produces more than 42,384 tons of paddy, wheat, and potato seeds worth Tk166.18 crore. The district supplies 2,850 tons of seeds worth Tk12.73 crore to the nearby neighbourhoods. (*Tbsnews*, 2020)

The groundwater level in the northern district of Dinajpur had been going down for decades. This started damaging agriculture. Four rubber dams, one mini rubber dam, and two cisterns are now serving as a source of relief for many farmers. Earlier, irrigating a bigha of land used to cost around Tk 4,000; now, the dams provide enough water. As a result, the irrigation cost has decreased from 2500 to 2000 taka. Along with increased agricultural production, the tourism industry has developed around the dam, positively impacting the district's economy. 11 thousand 665 hectares of agricultural land in the district have come under simple irrigation. Due to the Mohanpur Rubber Dam, there has been an increase in the cultivation of 10%, or 6.6 metric tons. The Punarbhava River Rubber Dam prevented the desertification of 1000 hectares of agriculture. As a result, an additional 6,000 tons of food grains are being produced. The beneficiaries receive financial benefits of about five crore tk annually. (*Jagonews24*, 2023)

The government has taken various initiatives to deal with the future food crisis. As a part of that, the government has undertaken a project to promote sustainable agricultural development in the Dinajpur region. The DAE will implement this project at a cost of Tk 65 crore 31 lacks by June 2027. There is an excellent opportunity to increase the intensity of crops and crop production by adopting agricultural technology that avoids climate risks, including modern farming technology. That, in turn, creates women and young entrepreneurs, commercialisation of agriculture, and introduction of new crops. (*Department of Agricultural Extension (DAE) of Dinajpur*, 2022)

II. Industrial Sector

The industry is an emerging sector in the Dinajpur district, with a few large and medium-sized enterprises operating there. 6.29% and 3.90% of the total income of Dinajpur district come from non-agricultural labour and the industrial sector, respectively (“Wikipedia” 2023). The district has the potential for industrial development due to its strategic location, availability of natural resources, and access to significant markets in Bangladesh and neighbouring countries.

The major industries in Dinajpur district are related to agro-processing, such as rice mills, flour mills, oil mills, and jute mills. In addition, some textile mills, chemical factories, and pharmaceutical companies are operating in the area. Setabganj Sugar Mills Ltd. and Dinajpur Textile Mills Ltd. are two of the major industries and factories in the Dinajpur district. As paddy is the main agricultural product of this district, there are about 2000 rice mills in terms of industry and factories, including about 100 automatic and semi-automatic rice mills. (*Dinajpur District*, 2022) Below is the information on medium and small-scale sectors:

| Name of Mill/Factory | Number |
|--------------------------|--------|
| Automatic rice mill | 61 |
| Semi-automatic rice mill | 35 |
| Chatal rice mill | 1861 |
| Major rice mill | 12 |
| Automatic Flower Mill | 6 |
| Cold storage | 9 |
| Jute mill | 1 |
| Lozenges Factory | 2 |
| Garments | 1 |
| Mixed Fertilizer Factory | 1 |
| Poultry Hatchery | 4 |

Source: (Dinajpur District Website, 2022)

Pulhat BSCIC operational factories are the most prominent part of the industrial sector, where entrepreneurs have invested 22 crores and 20 lakhs in these industrial establishments. Here, 54 industrial establishments were established on 189 plots. Out of these, 41 rice mills, five engineering industries, four chemical industries, one forestry industry, two textiles, and one industrial plot in the Ayurvedic sector have production processes. Besides this, in Dinajpur, there are around 300 Bazar to facilitate the economic activities of these districts. (Rangpur, 2019).

From 2016 to 2021, about 15 lakh 48 thousand crore tk was spent on various district development activities in these five financial years. Two mega projects, Dinajpur Economic Zone and Sheikh Kamal IT Training and Incubation Center, are currently under construction. (*Banglatribune*, 2023)

Dinajpur Economic Zone will be established on 308 acres of land in the Sundarban village of Dinajpur Sadar Upazila. About 250 local and foreign industrial establishments will be built there. Since this is an agro-based area, agro-processing factories, light engineering, garment and textiles, and pharmaceutical factories will be established. Another project, named Sheikh Kamal IT Park, has been planned for about 100 crore taka investment. It has been projected that about 2000 youth will emerge as skilled workforce from here every year. (*dailyjanakantha*, 2023)

Three of the five coal mines discovered in Bangladesh are in Dinajpur - Barapukuria, Phulbari, and Dighipara. On average, about 1500 tons of coal are mined daily in Barapukuria. Recently, iron mines were discovered in Hakimpur. The Hakimpur magnetite field has iron ore reserves of 62.5 crore tons. These natural resources also contributed to the industrial sector of Dinajpur. Considering the 25 percent recoverable reserves and the current annual requirement for raw materials (50 lakh tons), the Hakimpur field can supply raw materials for the next 30 years, according to the Geological Survey of Bangladesh. The economic value of this raw material will be Tk 1.6 lakh crore. Since iron has been discovered in Dinajpur, iron and steel factories will also be established here. Bangladesh is proud to have the world's only underground granite mine away from the sea. Madhyapara Hard Rock Quarry of Parvatipur Upazila of Dinajpur is a precious resource of Bangladesh. (*Tbsnews*, 2021)

Dinajpur district is 100% electrified now, increasing production, especially in industries. The government has undertaken a project on rural infrastructure development titled "Rural infrastructure development of Dinajpur district", which has been proposed to the Planning Commission. If the project is implemented, 24.44 percent of Upazila roads, 40.10 percent of union roads, 9.05 percent of village roads will be developed for the development of modern civic facilities in the rural areas of 23 Upazila of Dinajpur, Thakurgaon, and Panchagarh districts of Rangpur division. In the last five years (2016-21), the local government engineering department has done development work worth Tk 84 thousand 88 crores 50 lakhs in Dinajpur district. (*dailyjanakantha*, 2023)

III. Service Sectors

The service sector in Dinajpur district is diverse and includes a range of activities, including transportation, education, healthcare, tourism, and banking and finance. Transportation is an essential service in the Dinajpur district, with a well-

developed road network connecting the district to major cities in Bangladesh and neighbouring countries. Significant investment in the transport sector included 1 thousand 7 hundred 14.61 kilometres of road at 72 thousand 688 crore 81 lakh taka. Out of this, 1 thousand 3 hundred 24.02 kilometres of roads have been completed. 390.48 km of road work is going on. Construction of 1 thousand 866 decimal, 50-meter bridge and culvert has been completed at 4 thousand 931 crores 9 lakh taka. (dailyjanakantha, 2023)

The education sector includes one university, 118 colleges, ten vocational institutes, one textile institute, 617 secondary schools, 1713 primary schools, 11 community schools, 29 non-government schools, ten kindergartens, and 351 madrasas. In the last five years, the Department of Education and Engineering has carried out development activities worth Tk 46 thousand 936 crores in the Dinajpur district. This investment includes 60 private secondary schools, 60 additional secondary schools, 29 private madrassas, 29 educational institutions, and six government primary schools. Besides this, Two technical schools and colleges. 38 private colleges. Development of 9 government postgraduate colleges and nine educational institutions were developed under the Dinajpur Secondary and Higher Secondary Education. (dailyjanakantha, 2023)

The healthcare sector in the Dinajpur district is incorporated with several government and private hospitals, clinics, and pharmacies operating in the area. In recent years, there has been a focus on improving healthcare infrastructure and services in the district, with the construction of new hospitals and the introduction of mobile healthcare units in remote areas. There is a medical college in Dinajpur. The city has a 250-bed general hospital. Apart from this, there are 50-bed hospitals in two Upazila and 30-bed hospitals in the remaining 10 Upazila; besides health centres in many unions, 313 community clinics are functioning in Dinajpur. (dailyjanakantha, 2023).

Hasan et al., 2020 have done a survey in the Dinajpur municipality area on the health facilities, and the findings are given below-

Table: Number, types, and distribution of surveyed health facilities in Dinajpur municipality

| Facility Type | PUBLIC | NGO/NOT FOR PROFIT | PRIVATE | TOTAL |
|-------------------|--------|-----------------------|---------|---------|
| | (N=33) | (N=99) | (N=75) | (N=207) |
| Hospital | 2 | 4 | 1 | 7 |
| Clinic | 7 | 15 | 36 | 58 |
| Diagnostic center | 1 | 0 | 36 | 37 |

| Facility Type | PUBLIC | NGO/NOT FOR PROFIT | PRIVATE | TOTAL |
|---|--------|-----------------------|---------|---------|
| | (N=33) | (N=99) | (N=75) | (N=207) |
| The pharmacy attached to doctor's chamber | 1 | 0 | 0 | 1 |
| Doctors Chamber | 0 | 5 | 0 | 5 |
| Drop-in centre | 0 | 4 | 1 | 5 |
| Blood bank | 0 | 3 | 1 | 4 |
| Total | 11 | 31 | 75 | 117 |
| Satellite | | | | |
| Clinic | 2 | 66 | - | 66 |
| EPI center(immunization) | 20 | 2 | - | 22 |
| Total | 22 | 68 | 0 | 90 |

Source: (Hasan et al., 2020)

Tourism is a growing sector in the Dinajpur district, with several attractions such as the Ramsagar, National Park, the Kantajew Temple, and the Dinajpur Rajbari drawing visitors from both domestic and international. This has led to developing several hotels and resorts in the area, providing employment opportunities and boosting the local economy. There are about 20 hotels and resorts, a sign of the expanding tourism industry. Currently, the temple area of Kantiji has been declared a tourist area. This is the first time in the last 150 years that the temple of Kantiji has been extensively renovated. Tourist motels and resorts have been built next to the temple. A bridge has been constructed at around 30 crore taka for travelling to the temple. (Porjotonia, 2023)

Banking and finance are also essential services in the Dinajpur district, with several commercial banks and microfinance institutions operating in the area. This has led to increased access to credit and other financial services for local businesses and individuals, supporting the growth of the local economy. The district is served by 23 banks, 70 non-governmental organisations, and 13 insurance companies. (Dinajpur District, 2022)

IV. Poverty Scenario

A sizable proportion of the people in the Dinajpur district live below the poverty line, making poverty a severe problem. According to the latest data from the Bangladesh Bureau of Statistics, Dinajpur is one of the ten poorest districts in Bangladesh. As per a report published in 2010, 37 percent of residents in Dinajpur were living below the poverty line. Now, the number is above 64 percent, the

second-highest and poorest district in the country. At the same time, the rate is higher than in 2010. (Prothom Alo, 2022) Nonetheless, according to BIDS research, Dinajpur has a 42 percent overall poverty rate and a 26.3 percent extreme poverty rate. BIDS also found that, on average, 44.3 percent of people in Dinajpur are vulnerable non-poor. (Nuruzzaman, 2019)

Even if no current data on poverty is available, we can rationally assume that the effects of COVID-19 and recently increased inflation contribute to the poverty rate. The Department of Agricultural Marketing's district office records also indicate that the cost of necessities has increased over the previous two years. (Islam, 2022)

| Items | Average Price (2020) Per Kg | Average Price (2023) Per Kg | % Change |
|-------------------|--------------------------------|--------------------------------|----------|
| Boro (fine) | 45 | 61 | 36% |
| Boro (regular) | 36 | 53 | 47% |
| Loose flour | 29 | 33 | 16% |
| Loose wheat flour | 37 | 46 | 24% |
| Lentils | 58 | 97 | 68% |
| Loose soybean oil | 93 | 144 | 55% |
| Four eggs | 26 | 35 | 35% |

Source: Department of Agricultural Marketing's district office

V. Inequality Scenario

Inequality is a significant issue in the Dinajpur district, with disparities in income, wealth, and access to basic services. The income inequality in the district is higher than the national average, with the top-income households accounting for a significantly higher share of income than the bottom-income households. This statement is based on the fact that the rate of inequality is higher in the periphery than in the centre. The main drivers of inequality in the Dinajpur district include a lack of access to education and training opportunities, limited access to credit and financial services, a lack of job opportunities, and gender and ethnic discrimination. In addition, rural areas tend to have higher levels of inequality than urban areas.

VI. Employment Scenario

With the high unemployment rate and scarcity of formal employment options in the Dinajpur area, employment is a significant concern. Most of the population in Dinajpur district is engaged in agriculture, with a small number of people employed in the industrial and service sectors. Besides that, women's employment

is growing gradually in various SMEs and industries.

Approximately 12 thousand women workers are directly involved in “Papor” production in Dinajpur city. (Sangbad, 2023) Dinajpur’s jute mills have opened new employment doors for women workers. 60 to 70 percent of the workers in these factories are women. Rupali Bangla Jute Mills has given employment to 1500 people. (*Ajkerpatrika*, 2023) Lakhs of women from 80 villages of Dinajpur’s Nawabganj, Ghoraghat, Birampur, Chirirbandar, and Khansama Upazila untangled hair and made caps. Twenty-one wig manufacturing factories have been established in Dinajpur. At least two thousand women workers work in factories built with the cooperation of Chinese companies. In 2023, at least 10 thousand women will be employed in these factories. (Deshkal, 2023)

VII. Environmental pollution

Unplanned auto-rice mills in Dinajpur mainly destroy the environment. There are about two thousand rice mills. Besides the rice mills, there are more than three thousand boilers and huts for various processes, including boiling and drying of paddy. Toxic smoke, waste, dust, and ash from these auto-rice mills and huts are spreading in the residential areas. They are causing environmental catastrophes. Roads are blown away by smoke and ashes, and houses have become dark. Trees, ponds, and drains are being polluted. The area’s people have been affected by various diseases, including eye diseases, shortness of breath, and asthma. (*Bangladeshpost*, 2020)

The environmental impacts of coal mines and thermal power plants on the surroundings of Barapukuria are substantial. The coal-based power plants burn a tremendous amount of coal in a year and emit a considerable amount of carbon dioxide (CO₂), sulphur oxide (SO_x), nitrogen oxide (NO_x), suspended particulate matter (SPM), ashes, volatile organic, ultrafine/nanoparticles and various other organic matters through the chimneys. This resulted in a variety of environmental and health risks. Besides, the increased transportation activities of coal to the operation of the power plants have led to an increase in noise levels in the adjacent localities. (*Barapukuria | The Daily Star*, 2018)

In Barapukuria, subsidence causes waterlogging on the surface. The ecosystem is switched from terrestrial type to aquatic type. Vegetation in waterlogged areas disappears. Instead, alkaline-resistant vegetation appears in the mining area. The underground water level decreased slightly. As a result, the ecosystem is threatened with destruction. The Barapukuria coal mine area experienced significant land subsidence in its southern part as a big bang accompanied by a considerable jolt scared local people. (*Barapukuria | The Daily Star*, 2018). Other sources of pollution include-

The district is home to numerous small and medium-sized industries that release toxic effluent and waste into nearby waterways, contaminating water resources. Additionally, these industries' burning of fossil fuels and the use of outdated machinery have contributed to air pollution, posing significant health risks to the area's residents. Agricultural practices also contribute to environmental pollution in Dinajpur. Using excessive pesticides, herbicides, and fertilisers in farming has led to soil degradation and water pollution. The consequences of environmental pollution in Dinajpur have been severe. The pollution has led to health problems for the area's residents, including respiratory diseases, skin allergies, and stomach disorders.

4. Findings

- Despite its importance to the local economy, the agricultural sector in Dinajpur district faces several challenges. These include inadequate access to credit and other financial services, limited irrigation facilities, and a lack of modern farming techniques and technology. Climate change also affects agricultural production, with increased flooding and droughts leading to crop losses and reduced yields.
- The industrial sector faces several challenges, including a lack of infrastructure, inadequate power supply, and limited access to finance. Additionally, the district lacks skilled labour and modern technology, which hinders the sector's growth.
- The service sector creates employment opportunities and supports the growth of other sectors. With the right policies and investments, the service sector in Dinajpur district can grow and become an even more significant contributor to the district's economic development.
- The leading causes of poverty in Dinajpur district include limited access to education and healthcare, limited access to credit and financial services, and a lack of job opportunities. Poverty is particularly acute among marginalised communities such as women, ethnic minorities, and landless farmers.
- The government has implemented social safety net programs to support the poorest households in reducing inequality.
- There is a mismatch between the skills of the workforce and the needs of the labour market. In addition, women and marginalised communities such as ethnic minorities and people with disabilities face particular challenges in accessing employment opportunities.
- Toxic smoke, waste, dust, and ash from the rice mill are significant sources of environmental pollution in Dinajpur.

The economic landscape in Dinajpur is characterised by several challenges, including underinvestment, inadequate infrastructure, limited access to technology, poverty, inequality, and unemployment. Restricted access to credit and a lack of market linkages are significant obstacles to the growth and development of the agriculture industry and services sector. Poverty, inequality, and unemployment substantially hinder Dinajpur's overall macroeconomic growth and development. The use of secondary sources, such as newspapers, limits the depth and rigour of the study.

5. Recommendations

- In the agricultural sector, the government must take the initiative to improve irrigation, increase credit access, and provide farmers with training and support. Digital marketing of farm products and adaptation of modern technology should be the focal points. The agricultural storage infrastructure must be developed. Water flow in the river must be ensured with a proper river dredging system.
- To promote industrial development in the Dinajpur district, the government must improve the infrastructure and transportation system, provide incentives for investment and tax weaving, and create skilled manpower through training and support for local entrepreneurs.
- To improve the service sector, the educational institution should focus more on market demand and digital agriculture.
- To reduce poverty, we need to direct the benefits of the poverty elimination program to those who need them the most and soonest. Government policymakers, development partners, and implementing organisations (NGOs) must devise appropriate plans based on rigorous research for income generation and develop and improve their capacity to cope with this vulnerability.
- When taking the program, we have to keep in mind that the poor are a highly heterogeneous group rather than a homogeneous one. As a result, for sustainable poverty reduction, a one-size-fits-all strategy will not work, at least not in the long run. To achieve Goal 1 of the Sustainable Development Goals to eliminate poverty by 2030, we must devise a need-based holistic program and ensure focused targeting.
- To create a more just and equitable society, we must find the root causes of inequality, such as limited access to education and training and a lack of job opportunities, and promote policies that support inclusive economic growth and reduce income and wealth disparities.

- There is a prerequisite for continued investment in education and training, infrastructure development, and job creation to support the growth of the formal job sector.
- Strong regulatory measures are needed to control industrial effluent discharge, encourage the use of cleaner technology, and promote environmentally sustainable practices in the agricultural sector. Furthermore, a focus should be placed on developing waste management systems to reduce the amount of waste produced and promote recycling and proper disposal practices by fostering renewable energy utilisation.

Investment in physical infrastructure, technology, and human capital is necessary to support the growth and development of the agriculture industry and services sector. Establishing agri-processing facilities can help add value to agri-products and generate employment. Access to credit should be improved through the establishment of microfinance institutions and other credit facilities. Improving market linkages through establishing market information systems and contract farming can help farmers and agri-businesses access new markets and generate higher incomes. Addressing poverty, inequality, and employment issues is critical to supporting sustainable economic growth in Dinajpur.

More rigorous research is necessary to fully understand the complex economic dynamics at play in Dinajpur, including primary data collection and analysis.

6. Conclusions

This paper analyses Dinajpur's macroeconomic scenario, focusing on the agricultural, industrial, and service sectors, including a comprehensive picture of poverty, inequality, environmental pollution, and government development initiatives to overcome the obstacles to development and growth. The main strength of this district is agriculture, which is not only for subsistence but also for the surplus production of food grain at home and abroad. Though it is lagging in industrialisation and modernisation through government and private initiatives, the scenario has begun to change. There are many prospects, such as tourism, export, agropreneurship, and women empowerment, which policymakers must nourish to develop effective policies, projects, and programs to support economic growth and development in this district. Ultimately, the successful implementation of these projects can contribute to reducing poverty and inequality and support sustainable economic growth in Dinajpur.

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China's Renminbi as a Global Currency: An Appraisal

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Abstract

In the twenty-first century, China's economy has become immensely influential worldwide. Simultaneously, China's currency, the Renminbi (RMB) or Yuan, has become a global currency. China has successfully established the Renminbi as a global currency on the official and private levels. That means the Renminbi has reliably emerged as a medium of exchange, unit of account, and store of value. Contemporary trends reveal that the Renminbi has been increasingly recognised as a global currency.

Keywords: *China · Renminbi · Global Currency*

1. Introduction

In the twenty-first century, China's economy has emerged as a significant force on the global stage. Currently, China is the second largest economy in the world (Gjoza 2018: 1). Renminbi (RMB) is the currency of China. Renminbi is also known as *the Yuan* (Gjoza 2018: 1). However, in the meantime, the Renminbi has positioned itself as a global currency.

It is not easy for a country's currency to be recognised as a global currency. There are many determinants of an international currency. Some of those determinants are the size of the domestic market of a given country, network externalities, financial markets, and confidence in the country's currency.

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Step by step, China has directed the Renminbi from regionalisation toward internationalisation. For that purpose, China has ensured openness to international markets. In addition, China has deepened international trade cooperation. China has improved Renminbi's global acceptance and status. In total, China has accelerated the trajectory of Renminbi's internationalisation.

Internationalization of a currency means wide use of that currency in denominating and settling international trade and transactions (Xia 2018: 668). China's proactive efforts to establish the Renminbi as a global currency has increased its confidence and importance. Significantly, China has started massively using the Renminbi in international trade and foreign exchange.

Since 2016, the Renminbi has been included in the reserve currency basket of the International Monetary Fund (IMF) (Kwan 2018: 871). IMF maintains the Special Drawing Rights (SDR), the reserve currency basket (Li 2018: 252). IMF's inclusion of the Renminbi into the SDR basket provides the required confidence for foreign central banks for the Renminbi as a reserve currency (Harrison and Xiao 2019: 4). So, the Renminbi is likely to hold a strong position soon as a global currency.

As a global currency, the Renminbi has enormous potential to influence international monetary relations (Twarowska 2018: 6049). China's massive share of global trade justifies the increasing importance of the Renminbi in international relations.

2. Theoretical Framework: Cohen Matrix of International Currency Use

B. J. Cohen provided a matrix of international currency use in the book *The Future of Sterling as an International Currency* (Twarowska 2018: 6051). Cohen's matrix of international currency use is pertinent to the study on the Renminbi as a global currency (Twarowska 2018: 6051). The international model of the matrix is also attributed to P.B. Kenen (1983) and Thimann (2009) (Twarowska 2018: 6051).

Table 1: Cohen matrix of international currency use

| Theorist's matrix | Private use | Official use |
|-----------------------|-----------------------------------|---|
| Medium of exchange | Vehicle currency | Intervention currency |
| Unit of account | Quotation currency | Anchor currency |
| Store of value | Investment and financing currency | Foreign exchange reserve currency |
| Practitioner's matrix | Use in financial markets | Use in third countries |
| | International debt markets | Exchange rate anchor, Foreign exchange reserves |
| | Foreign exchange markets | |
| | International trade invoicing | Cash and parallel currency use |

Source: Twarowska, 2018, p.6051

The matrix of international currency use elaborates on the functions of money. The Cohen matrix can help understand the Renminbi's position as a global currency.

Firstly, a particular currency becomes a global currency if it is widely used as a *medium of exchange*, *unit of account*, and *store of value*. Thus, in simple words, an international currency is substantially used as a means of payment outside the issuing country.

Secondly, a global currency needs to hold a strong position in the private and official sectors. In private uses, an international currency should act as a vehicle currency, quotation currency, and investment and finance currency. Then, in official uses, a global currency should act as an intervention currency, anchor currency, and foreign exchange reserve currency.

Thirdly, a global currency is extensively used in international financial markets. A global currency is broadly used in international debt markets, foreign exchange markets, and international trade invoicing.

Fourthly, a global currency is widely recognised and used in third countries (foreign countries) as an exchange rate anchor, foreign exchange reserves, and cash and parallel currency. The trust of other nations is very important in turning a particular currency into a global currency.

Fifthly, the magnitude of a currency issuer's economy plays a vital role. Specifically, the position and strength of the issuer country in the world economy are important. In fact, the stronger a country's position in the world economy is, the more likely it is that foreign countries will use its currency (Twarowska 2018: 6050).

Furthermore, institutional and legal conditions and macroeconomic stability are crucial in earning confidence in a particular currency as a global currency. In reality, the larger and more liquid the financial market is, the higher the possibility foreign countries accept that country's currency as a reserve currency (Twarowska 2018: 6050). Once a particular currency is well accepted for cross-border transactions, the currency comes to be widely acknowledged as a global currency.

3. Methodology

This study used qualitative research methodology. It collected and reviewed many books, journal articles, research papers, etc. Thus, secondary data from various sources was used. The research paper was then drafted as a journal article. Overall, this paper is presented from an objective perspective.

4. Literature Review

China has become a significant power on the global stage in terms of political economy considerations (Gjoza 2018:1). Meanwhile, China's currency, Renminbi, has emerged as a worldwide currency. The influence of a global currency extends to the entire world (Xia 2018: 668). An international currency is widely used to invoice international trade, to settle payments in trade in goods and services and financial transactions, to denominate financial assets, and to serve as reserves with confidence for foreign central banks (Edwin 2015: 3). Internationalization of a currency refers using it extensively in denominating and settling global trade and cross-border financial transactions (Gjoza 2018: 3).

Internationalisation of a currency is a complex process (Chey 2012: 5). From the Second World War (WW II) till date, the US Dollar, the British Pound, the Japanese Yen, the German Mark, and the Euro played role in global currencies (Zhang 2015: 4). And, before the WW II, for several centuries, the currencies of Great Britain, the United States (US), France and Spain played significant role as international currencies.

The role and function of a global currency can be considered at the official and private levels (Xia 2018: 668). At the *official* level, a global currency acts as the intervention currency, the pegged currency and the international reserve currency (Xia 2018: 669). Besides, a global currency, at the *private* level, acts as the settlement, valuation, and alternative currency in international trade and financial markets (Xia 2018: 669).

There are several critical factors of currency internationalisation. Those factors include—the economic strength of a country, the foreign trade volume of the country, the development of financial markets, and the trend of the stability of currency value (Xia 2018: 669). However, the internationalisation of a country's currency requires—the government's intervention in its currency and the domestic and international transaction networks formed by market forces (Xia 2018: 669).

Some conditions for a fully internationalised currency are the issuer's larger share of global trade, finance, and output, a highly open economy, flexibility of foreign exchange, confidence and predictability of the currency, and relative stability of currency value (Xia 2018: 669).

The Renminbi (RMB) has been contributing as a global currency (Gjoza 2018: 24). China intends to promote the Renminbi as both a reserve currency and a means of cross-border transaction. To make the Renminbi widely used, China has already relaxed the restrictions (Gjoza 2018: 2). China has gradually promoted the Renminbi from regionalisation toward internationalisation (Xia 2018: 667). China has improved the Renminbi's global status, increased openness toward international markets, and deepened foreign trade cooperation (Xia 2018: 667).

Chinese authorities have taken necessary steps to support the internationalisation process of Renminbi (Harrison and Xiao 2019: 4). There are many *political* and *economic* drivers for turning a particular currency into a global one (Gjoza 2018: 5). *Political drivers* are—influence and prestige, security issues, domestic reform, and appropriate opportunity. In addition, *economic drivers* are—trade, commodities and services, borrowing, and financial development (Gjoza 2018: 6). Politically, the Chinese leadership has articulated its visions and adopted a sufficiently large number of measures for its economic diplomacy to make Renminbi a genuinely global currency (Daojing 2015: 86).

On 1 October 2016, the Renminbi was formally added to the Special Drawing Rights (SDR) basket of the International Monetary Fund (Kwan 2018: 871). Special Drawing Rights are the IMF's foreign exchange reserve assets (Li 2018: 252). IMF's inclusion of the Renminbi into the SDR basket ensures proper justification for foreign central banks to include the currency in their foreign currency reserves (Harrison and Xiao 2019: 4). As a result, the Renminbi is likely to play a more critical role after being a part of IMF's SDR basket.

Rationally, the Renminbi is expected to hold a more robust position soon as a global currency (Harrison and Xiao 2019: 4). The People's Bank of China has concluded swap agreements with foreign central banks in recent years to ensure a sufficient supply of Renminbi (Harrison and Xiao 2019: 4).

The contemporary trend indicates that the Renminbi is increasingly recognised as a global currency (Zhang 2014: 1). significantly, China has started to extensively use Renminbi in international trade and transactions (Frankel 2011: 12). Notable developments in Renminbi internationalisation since the beginning of the twenty-first century include—trade settlement in Renminbi, cross-border direct investment in Renminbi, reserve currency, and currency swaps with foreign central banks (Zhang 2014: 6). Overall, Renminbi has a great potential as a global currency (Twarowska 2018: 6049).

5. Findings and analyses

4.1. Renminbi becomes an International Currency

China's economy is the second largest economy in the world. In contrast, the United States (US) economy is the largest (Gjoza 2018: 1). China's currency, Renminbi, has already become an international currency. It is noteworthy that the internationalisation of the Renminbi is relevant to China's global prestige and influence (Gjoza 2018: 1). Interestingly, the internationalisation of a currency is a political economy issue rather than a mere economic one (Chey 2012: 13). Apparently, China has been working to translate economic strengths and

achievements into international influence and global prestige.

By the first decade of the twenty-first century, China's economy has emerged as a significant force on the global stage (Gjoza 2018: 1). Simultaneously, the Renminbi has positioned itself as a worldwide currency. China has made up the Renminbi, an international currency at the official and private levels. So, the Renminbi has reliably emerged as a medium of exchange, unit of account, and store of value. With it, recent trends reveal that the Renminbi is increasingly recognised as an international currency.

4.1. Role of an International Currency

A global currency is required to perform manifold activities. First, a global currency acts as a reliable medium of exchange. A global currency is a vehicle currency for foreign exchange intervention. Besides, a global currency is generally acceptable for invoicing trade and financial transactions. Secondly, a global currency can serve as a unit of account. An international currency is used to anchor for pegging currency. An international currency is also used to denominate trade and financial transactions. Thirdly, a global currency serves the purpose of store of value. A global currency acts as an international reserve. In addition, an international currency is commonly used for currency substitution.

Table 2: Role of an international currency

| Function of Currency | Governments | Private Actors |
|----------------------|--|---|
| Medium of exchange | Vehicle currency for foreign exchange intervention | Invoicing trade and financial transactions |
| Unit of account | Anchor for pegging currency | Denominating trade and financial transactions |
| Store of value | International reserves | Currency substitution |

Source: Gjoza, 2018, p.8. (based on Frankel 2012)

4.1. Gradual developments of Renminbi's internationalisation

In the initial phase, China relaxed its openness to Renminbi usage. China realised that the Renminbi must be officially added to the international monetary flow, So It aimed to include it in the Special Drawing Rights basket of the International Monetary Fund.

Table 3: Gradual developments in Renminbi's internationalisation

| Time | Development of Renminbi's Internationalization |
|-----------------------|--|
| July 2005 | China stops Renminbi's peg to the US dollar |
| May—July 2007 | The first off-shore denominated Renminbi bonds (known as dim-sum bonds) are issued |
| July 2009 | China takes a pilot project to settle Renminbi transactions internationally. |
| March—December 2010 | China launches the Chiang-Mai initiative with a US\$120 billion currency swap arrangement. |
| January—December 2011 | China allows Chinese companies to invest in foreign countries in Renminbi. directly |
| 2012—2014 | Direct trading between Renminbi and foreign currencies expands. |
| October 2016 | International Monetary Fund includes the Renminbi in the Special Drawing Rights basket |

Source: Compiled by authors (based on the data from Gjoza, 2018, p.10.)

China has gradually developed Renminbi as a global currency. To begin with, China ended the Renminbi's peg to the US dollar in July 2005. China issued the first off-shore denominated Renminbi bonds in 2007. Then, China adopted a pilot project to settle Renminbi transactions in 2009. 2010, during the global financial crisis, China launched the Chiang Mai initiative with a US\$120 billion currency swap arrangement to prevent speculation in financial markets. China has allowed Chinese companies to invest directly in foreign destinations in Renminbi. After that, China has permitted wide-scale direct trading between Renminbi and foreign currencies. Eventually, in October 2016, the International Monetary Fund incorporated the Renminbi in the Special Drawing Rights basket.

4.1. China's Share in the World Economy

China's share in the world economy is important to understanding Renminbi's global position. A country's economic influence and potential are clearly reflected in its share in world production (Gjoza 2018: 6052).

Table 4 (a): Share in world GDP (current prices) in 1995, 2017 and 2022 (projection)

| Country | 1995 | 2017 | 2022 |
|---------------|-------|-------|-------|
| China | 2.40 | 15.10 | 17.80 |
| United States | 24.70 | 24.40 | 22.80 |
| Euro Area | 24.30 | 15.80 | 14.80 |
| Japan | 17.60 | 6.20 | 5.30 |

Source: Gjoza, 2018, p. 6052.

In terms of Gross Domestic Production (GDP) (current prices), China has steadily advanced towards a more significant share of the overall world economy. In contrast, Japan has gradually shrunken. However, China will likely score an increased share of the world economy in the coming years. China holds solid economic power in the international system.

Table 4(b): Share in world GDP (in PPP dollar) in 1995, 2017 and 2022 (projection)

| Country | 1995 | 2017 | 2022 |
|---------------|-------|-------|-------|
| China | 5.90 | 18.30 | 20.50 |
| United States | 20.10 | 15.30 | 14.00 |
| Euro Area | 18.20 | 11.60 | 10.50 |
| Japan | 7.80 | 4.30 | 3.70 |

Source: Gjoza, 2018, p.6052.

Apparently, China's economy is the fastest growing among the world's top economies. China is a dominant global trader (Gjoza 2018: 6052). Contemporary trends predict a further strengthening China's influence in the world economy.

4.1. Renminbi's share in the Special Drawing Rights basket

International Monetary Fund has included the Renminbi in the Special Drawing Rights basket as the fifth currency in 2016. In fact, the growing influence and role of the Renminbi as a global currency has been affirmed by its inclusion in the Special Drawing Rights.

Table 5: Renminbi's Share in the Special Drawing Rights

| Currency | Share Percentage (%) | |
|----------------|----------------------|-------------|
| | 2010 Review | 2016 Review |
| US Dollar | 41.90 | 41.73 |
| Euro | 37.40 | 30.93 |
| Renminbi | | 10.92 |
| Yen | 9.40 | 8.33 |
| Pound Sterling | 11.30 | 8.09 |

Source: Compiled by the authors (based on IMF data 2017 presented in Gjoza, 2018, p.6060)

Current data signifies that the global economy is in a process of change, and the Renminbi holds an influential position. During the 2010 review, the Renminbi was not present in the Special Drawing Rights. On 1 October 2016, it was included in the Special Drawing Rights. In the IMF data 2017 (based on a 2016 review), the Renminbi scored 10.92 percent in the Special Drawing Rights. So, the Renminbi has achieved a larger scope of contributing to the international monetary system.

4.1. Final Point

China has made numerous endeavours to internationalise Renminbi as a global currency. Over decades, the Renminbi has emerged as a convertible, acceptable and reliable currency worldwide. China's high share in world trade has facilitated Renminbi as a well-known medium of payment (Gjoza 2018: 6057). Specifically, China's position as the leading exporter in the global economy has facilitated Renminbi opportunities for invoicing international trade. However, foreign investors' confidence in Renminbi is essential to sustain the status and influence of Renminbi as a global currency.

The Renminbi's internationalisation goes with the Cohen matrix of international currency use. Concurrently, the Renminbi plays an anchor currency in the global monetary system. Moreover, the Renminbi is an essential currency as a medium of exchange, unit of account, and store of value. The Renminbi has achieved recognition as applicable at the official and private levels. Furthermore, the Renminbi has been reliably used in financial markets and third countries. Many countries now perceive the Renminbi as a reserve currency. To recapitulate, the role and influence of the Renminbi as a global currency have been well-established. Contemporary trends suggest that the Renminbi as a global currency will be further strengthened.

5. Conclusion

There are numerous significant achievements of the Renminbi as a global currency. Wide-scale trade settlement in Renminbi is a prominent achievement. Cross-border direct investment in Renminbi is another eminent achievement. In addition, the Renminbi is a reserve currency. Furthermore, the convenient process of currency swaps with foreign central banks makes the Renminbi a competent global currency. In the meantime, the International Monetary Fund has included the Renminbi in the Special Drawing Rights basket of the global monetary system. Across the board, China's efforts to internationalise the Renminbi conform to Cohen's matrix of international currency use. Undoubtedly, the Renminbi has far-reaching potential as a global currency.

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Understanding the Role of Fathers in Rural Bangladeshi Households to Reduce Violence Against Children

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Abstract

Violence against children (VAC) is a global public health, human rights, and social problem with potentially severe and expensive repercussions that transcend geographical, racial, socioeconomic, and cultural barriers. Its harmful repercussions are detrimental to children in every country, impacting families, communities, and nations, and spanning generations. The most prevalent characteristic of VAC is that it is an accepted aspect of cultural construction in many countries that has received less attention than other social challenges. In Bangladesh, like in many nations of the global South, where the family is widely treasured as a private place, preventing VAC is far more challenging. Follow-up on cases of child abuse committed by family members often exacerbates the difficulty. Fathers are consistently seen as the most influential decision-makers in these countries, where mothers are recognised as the primary caregivers in their children's health, education, and social life (Ball & Wahedi, 2010). This authoritative role of fathers frequently results in violence against their children (VAC) despite the paucity of studies examining the relationship between fatherhood and VAC. This study, therefore, investigates the prevalence of violence against children in the study areas and the ways to prevent violence against children (VAC) by positively incorporating fathers in household chores and childcare responsibilities. Based on mixed-methods research conducted among parents in five Bangladeshi districts, this paper looks into the impact of fathers' positive participation in home duties and childcare on VAC in rural Bangladeshi households. This paper proposes, based

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on the findings of this research project, that violence against children within families can be significantly reduced by involving fathers in household chores and caregiving practices.

Keywords: *Fatherhood · Violence Against Children · Rural Bangladesh*

1. Introduction

Globally, the art of fatherhood has evolved alongside the emergence of various family structures and living arrangements. Fatherhood is undeniably essential to the formation of masculine identity. Scholarly attention to fatherhood is limited compared to motherhood and has been historically underrepresented in feminist literature (Marsiglio et al., 2000). Therefore, little is known about the factors that lead to changes in a father's engagement with children over time, and a lack of experience and willingness to assume the role typically prevents fathers from connecting effectively with their children (Hoffman, 2011).

The meaning and function of fatherhood have evolved progressively over the decades, yet this is frequently overlooked or not completely acknowledged in specific social contexts (Cabrera et al., 2000). Since the 1970s, a rising body of research on fatherhood in developing countries has highlighted the significance of the father's engagement in children's social, emotional, and intellectual outcomes at all stages of development (Henry et al., 2020). According to recent findings on fatherhood, children are more likely to thrive socially, emotionally, and cognitively when their fathers are positively involved in their lives (Baker et al., 2018). This effect is more evident among children in low-income countries with below-average educational systems (Mathwasa & Okeke, 2016).

Different contextual interpretations of traditional biological fatherhood and other fathering interactions are often reflected in scholarly interest in fatherhood. According to Trip-Reimer and Wilson (1991), different cultural practices and social structures, such as kinship patterns, family structures, and economic systems, may be directly tied to the variations in paternal experiences. Simultaneously, several studies examined the impact of fathers' involvement in children's early lives, even into adulthood. Although, in general, it appears that fathers within families should have more positive interactions with their children, research evidence indicates this is not always the case. For example, Yildirim and Roopnarine (2015) found that biological fathers hardly engage and interact with their children in Southern African countries. On the other hand, Smyth, Spence, and Murray's (2015) research in Australia shows that many unmarried men who are not biological fathers still serve as social fathers to children from other families. In several countries, the concept of co-parenting, in which both parents share and coordinate the degree of support and solidarity as parents, has received far less attention (Feinberg &

Kan, 2008). Although mothers are considered the primary carers in India and Bangladesh, fathers are frequently regarded as the most significant decision-makers about their children's health, education, and social development (Ball & Wahedi, 2010). Such an authoritative role of fathers frequently results in violence against children (VAC). Although statistical information on fathers' control over their children is scarce, it is a fact that globally, children often fall victim to physical and psychological violence by their fathers or stepfathers (Cavanagh et al., 2007). However, in South Asian societies, corporal punishment and many other forms of abuse are not considered by the parents as VAC. Fathers, as the head of the family, not only use but reinforce the practice of VAC.

In Bangladesh, as in many countries of the global South, there is a large data gap on how fathers exercise control over their children, but it is evident that physical and psychological violence is a frequent approach. In Bangladesh, where the family is treasured mainly as a private place, avoiding VAC is far more challenging. Follow-up on incidents of VAC done by family members often complicates the situation. Likewise, countries and other human rights agencies frequently view family violence as a personal affair and refuse to intervene. On the one hand, children's dependence on their parents usually exposes them to a vicious cycle of physical and psychological abuse, which is frequently encouraged by the widespread assumption that parents have the right to govern their children. On the other hand, since children are less likely to be seen as trustworthy witnesses, their accusations are typically refused or ignored. In a patriarchal culture such as Bangladesh, ensuring and exercising authority over family members, especially children, therefore is an integral part of being a father.

While it is true that a significant number of men are involved with their children in Bangladesh for a variety of reasons (Chaudhury, 2013), the necessity of involving fathers in positive parenting is frequently overlooked within various social institutions, including the family, which merits feminist attention. Bearing this in mind, the Centre for Men and Masculinities Study (CMMS) in Bangladesh conducted the *Priyo Baba* research project from 2014 to 2016 in an attempt to enhance the role of men in reducing violence against women and children in rural Bangladeshi families. This research sought to better understand the shifts in masculinities and the corresponding gender roles in specific Bangladeshi communities. Through the facilitation of community dialogues, the research also explored how fathers' positive involvement in caregiving activities and domestic chores results in positive changes within families, hence decreasing violence against children. Based on mixed-methods research conducted among parents in five Bangladeshi districts, this paper examines how fathers' positive involvement in household chores and childcare contributes to the reduction of violence against children in rural Bangladeshi families.

2. Justification: Why It Is Important to Engage Fathers in Reducing Violence Against Children

Violence against children (VAC) generally consists of deliberate neglect, verbal abuse, insults, defamation, isolation, rejection, threats, emotional apathy, and humiliation. The definition of VAC is often expanded to include the intentional use of physical force or power, threatened or actual, against a child by an individual or group that causes or has a high chance of causing actual or potential harm to the child's health, survival, development, or dignity (Lansdown, 2014). According to Gil (2013), for example, VAC is the intentional, non-accidental use of physical force by a parent or other carer to damage, injure, or destroy the child. United Nations Child Rights Convention (UNCRC) defines VAC as all types of physical or mental violence, injury and abuse, neglect or negligent treatment, maltreatment, or exploitation, including sexual abuse (Lansdown, 2014). These definitions include the critical components of VAC and underline the fact that violence extends beyond physical damage to encompass emotional and psychological dimensions and can occur in a variety of contexts and situations.

Being a global human rights and societal issue, violence has destructive and severe consequences on children that transcend geographical, ethnic, socio-economic, and cultural barriers (WHO, 2014). Due to its complexity, multidimensionality, and varied definitions, it is tough to track and analyse the trends, preventative measures, and response strategies to address violence against children. The most ubiquitous reality about violence is that it is an accepted component of cultural construction in many nations that has received less attention than other social challenges. These effects have a significant impact on the ability of children to fulfil their full potential throughout their lives. It incurs substantial economic and social costs and violates constitutional and legal rights against maltreatment, neglect, abuse, and humiliating treatment against children (Mathews & Benvenuti, 2014). VAC has extensive intergenerational effects on the physical, social, and emotional health of many children. Its harmful repercussions are detrimental to children in every nation, affecting families, communities, and nations and spanning generations (Hillis et al., 2016).

In addition to physical punishments, it has been widely seen and documented that younger children are regularly subjected to non-physical forms of domestic violence, such as repeated threats, insults, and verbal abuse (UNICEF, 2005). Besides schools, streets, workplaces, entertainment venues, care facilities, and detention centres, children face violence even in their families. It has been demonstrated that violence against children by parents and other family members has escalated in the global South in recent years, regardless of the children's gender, race, ethnicity, class, or social status. Common perpetrators of such violence against children

within their families are parents, relatives, and neighbours. In many countries of the global South, where the family and household are primarily responsible for protecting and assuring the physical and mental safety of children, they often become the sites of physical, sexual, and psychological violence against children. This might not be an obvious consequence, but children exposed to violence are more likely to engage in violent behaviour than adults.

Researchers have observed a strong correlation between early exposure to violence and its consequences in later stages of life. There is also scientific evidence that acute stress in response to violence can damage brain architecture, immunological state, metabolic systems, and inflammatory responses (Anda et al., 2010). Not only can such events cause permanent damage to the neurological, endocrine, and immunological systems, but they can also influence the genetic modification of DNA (Danese & McEwen, 2012). Thus, VAC incurs substantial economic and social costs and violates constitutional and UNCRC guarantees for children from maltreatment, neglect, abuse, and degrading treatment (Mathews & Benvenuti, 2014). Although the UNCRC and other human rights treaties³⁵¹ guarantee children's right to private and family life within the home, physical, sexual, and psychological violence against children is pervasive in many countries, especially in the global South. While these rights impose a responsibility on the state to take proactive measures to prevent violence against children and to prevent further harm when a child has been subjected to violence, in a country like Bangladesh, there has been a lack of empirical data on the problem's magnitude.

VAC in Bangladesh frequently spreads from the home to the community and vice versa, resulting in multiple and interconnected effects on children. For instance, a son who observes his mother being abused by her father/partner is also exposed to harsh parenting, including the use of corporal punishment as a form of discipline. Consequently, the boy child frequently seeks attention outside the family, is enticed into crime by the local gang, and drops out of school (Mathews & Benvenuti, 2014). The lack of empirical research also limits our understanding of such a problem, particularly at the family level, resulting in a lack of initiatives to engage fathers in the prevention of violence against children.

3. Methodology

This section outlines the methods of data collection and analysis, the target areas and population, and ethical considerations. In this research, we collected data using both qualitative and quantitative methods. Quantitative methods include a questionnaire-based survey, whereas qualitative methods include Focus Group

¹ Such as the International Covenant on Civil and Political Rights (ICCPR) and the International Covenant on Economic, Social, and Cultural Rights (ICESCR)

Discussions (FGD) and Life History Interviews (LHI), which will be briefly discussed in the following sections.

3.1. Study Sites and Population

This research was carried out in five districts, taking into account the geographical diversity of Bangladesh. The districts, including Rangpur, Pabna, Natore, Sirajganj, and Cox's Bazar, are highlighted on the following map. Within these districts, we choose specific research areas. Katanga, Chatmohor, and Narayanpur, for instance, were from Pabna; Borochoira and Rakhainpolli from Cox's Bazar; Biharipara and Gongmochora from Rangpur; Gurudaspur and Boraigram, from Natore; and Tarash, from Sirajganj. Our target populations in this research include ethnic and religious minorities such as Bihari, Bindi, and Mahato from extremely poor communities. We also selected barbers, cobblers, shopkeepers, day labourers, fishermen, rickshaw and van pullers from Rangpur, Cox's Bazar, and Pabna's extremely poor communities.

Figure 1-Map of Bangladesh
(Five districts under study)



3.2. Data Collection and Analysis

Sampling and data collection in this research occurred in two phases. The first phase involved the survey using purposive sampling to understand the prevalence

of violence against children in the studied locations. In this phase, a structured questionnaire was administered to randomly selected fathers from the selected communities. The purpose of the questionnaire was to determine fathers’ views, attitudes, and behaviour about parenting and violence against children. We were able to survey around 300 fathers throughout five districts. Key explanatory and outcome variables were chosen to code the collected data from the survey. Using SPSS, the survey data were classified into numerous categories to assess similarities, differences, and patterns and were then grouped. Instead of pre-coding, this strategy was utilised to determine how variable data functioned in its context. The graph below represents the sample population in each district according to their ethnicity.

The graph below indicates the ratio of fathers based on their religious background. 57.5 percent of the fathers sampled in five areas were Muslims and 42.5 percent were Hindus.

Graph 1- District-wise distribution of the sample population according to ethnic background

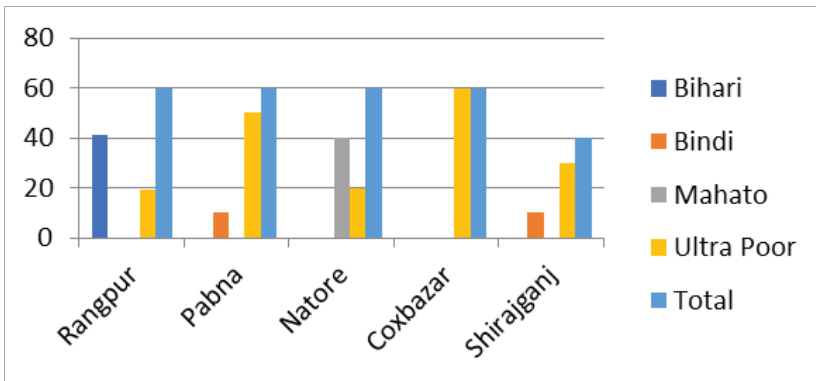


Table 1: District-wise distribution of the sample population based on religion

| District | Religious Status | | Total |
|--------------|------------------|-------|-------|
| | Islam | Hindu | Total |
| Rangpur | 60 | 0 | 60 |
| Pabna | 8 | 52 | 60 |
| Natore | 20 | 40 | 60 |
| Cox’s Bazaar | 48 | 12 | 60 |
| Sirajganj | 26 | 14 | 40 |
| Total | 161 | 119 | 280 |

The second phase comprises the collection of qualitative data using Focus Group Discussions (FGDs) and Life History Interviews (LHIs). First, 45 FGDs were conducted with fathers from both nuclear and extended families to determine the current fatherhood practises within the family. Positive fatherhood cases were selected from the FGDs for Life History Interviews (LHI). The LHIs helped us understand the lifelong experiences, motivational factors, and impacts of fathers' engagement in household chores and child-rearing practices that result in a reduction in family violence against children.

Word-for-word data was transcribed into a narrative format for qualitative data analysis. Numerical or textual codes were used to identify data matching specific themes. Data were also triangulated multiple times to confirm their reliability and internal validity. The data triangulation also took into account nonverbal cues from participants. Text, image, audio, and video source materials collected for data analysis were utilised effectively.

3.2. Ethical Considerations

In social science research, ethical concerns merit special consideration. Following that, considerable thought has been given to the question of ethics in this research. Respecting the rights, interests, values, and wishes of the participants, as has been repeatedly emphasised by social scientists, we took their position and institutions into account (Marshall & Rossman, 1989; Merriam, 1988; Locke et al., 1982; Spradley, 1980). In this study, research objectives and a description of how data will be utilised were given. A consent letter was developed to obtain the participants' formal permission to share their personal information. Prior to conducting the interviews, their written and, in some cases, verbal (for individuals with low literacy) consents were obtained. The form was read aloud to assist participants in understanding the whole data collection procedure and accompanying devices. In recognition of the participants' rights, their anonymity, wishes, and interests were kept confidential.

4. Findings and Analysis

This section summarises the findings and analyses of the research. This section is an examination of the prevalence of violence against children (VAC), particularly by fathers, in the research locations. This section contains three subsections. In the first subsection, we discuss the existing status of violence against children in light of the survey conducted among fathers in the places under study. Then, we describe the factors leading to VAC based on the narratives gathered from the focus group discussions (FGDs) and life history interviews (LHIs) with fathers. From there, we identified some examples of fatherhood in which the father's participation in childcare and household chores resulted in a decline in VAC.

4.1. Prevalence of Violence Against Children in Researched Locations

Our research indicates that, regardless of the gender, race, religion, or ethnicity of the parents, violence against children is highly prevalent in rural communities. Among the ethnic and Bengali communities where we conducted fieldwork, the most frequent perpetrators of VAC are family members such as parents and close relatives, including grandparents, aunts, uncles, and siblings. In these areas, fathers were frequently observed shouting, slapping, threatening, and assaulting their children. The table below depicts the percentage of fathers committing VAC within ethnic (such as Bihari, Bindi, and Mahato) and Bengali communities.

Table 2: Percentage of the parents across ethnic groups who use different forms of VAC (Results are based on multiple responses; Cumulative responses regarding the answer 'Sometimes, Rarely and Always' counted.)

| Ethnic Groups | <i>Shouting/ Scolding</i> | <i>Slapping</i> | <i>Threatening</i> | <i>Beating with sticks</i> | <i>All</i> |
|---------------|-------------------------------|-----------------|--------------------|--------------------------------|------------|
| Bihari | 90.2 | 58.5 | 60.9 | 39 | 52 |
| Bindi | 80 | 80 | 60.9 | 55 | 40 |
| Mahato | 100 | 99.5 | 87 | 85 | 88 |
| Bengali | 93.9 | 81 | 81 | 47.5 | 45.6 |

As indicated in the table above, the rate of violence against children by fathers is very high across all ethnic groups. The survey reveals that VAC is most prevalent in the Mahato community. In both ethnic and Bengali communities, slapping, scolding, and shouting were the most often reported types of VAC. In addition to yelling, scolding, and slapping their children, data reveal that parents in the three ethnic groups of Bihari, Bindi, and Mahato primarily employed beating and threatening to discipline their children. Participants from Jalesshor para, Katenga Uttor para, Chaikola Khara para, Boraigram, Cholonnali Nishipara, Bihari Camp, Alamnagar, Shangcardaho, and Gangachara reported that whenever children cause a problem or ask for something beyond their means, they are either beaten, chastised, or threatened both verbally and non-verbally.

Our research demonstrates that family privacy and other societal constraints prevent the disclosure of these incidents, devastatingly impacting children. Some parents, particularly fathers, believe they have the authority to regulate their children by whatever means. As a result, they regularly scold, threaten, or beat their children for any offence. This piqued our interest in the primary causes of

VAC by fathers in rural communities. We employed qualitative methods such as focus group discussions and life history interviews with fathers during the second phase of our data collection. The following section presents the narratives gained from the LHI and FGDs.

Why do fathers commit violence against children?

This section examines the causes of fathers' violence against their children. The first reason was fathers' socioeconomic status, and the second was to discipline and cultivate good human beings in children. The final cause we identified was men's reluctance to share household chores and violent behaviour towards their wives, which ultimately led to an increase in family violence against children, which will be discussed in greater detail below.

4.1.1. Socio-economic Status of Fathers as a Cause of Violence Against Children

The socio-economic status of fathers is one of the primary reasons why they are abusive to their children. In rural poor communities, fathers' low incomes and inability to provide their children with the necessary food, clothing, and toys frequently lead to unhappiness and despair. Over time, such dissatisfaction and frustration lead to rage and violence against children. In a focus group discussion, fathers of Gangachara Thana in Rangpur stated that their failure to meet their children's needs leads to dissatisfaction and conflict between parents and children. According to the fathers, such emotional tension can frequently manifest itself as rage, improper behaviour, and violence against children. According to the fathers of Jaleshshorpara, Gonaigacha, it is frequently intolerable for parents to endure their children's whining over toys or food they want or their refusal to eat or sleep. The majority of them believe slapping or shouting at nagging children is appropriate.

In addition to socio-economic factors, it has been observed that the level of education of fathers is a crucial determinant of their parenting knowledge and their child's psychological development. At Jaleshshorpara, Gonaigacha, and Nishipara in Natore, where child abuse was rampant, the vast majority of fathers were illiterate. Rouf's father from Gurudaspur claimed, "Most people in our village cannot read or write. They do not have any institutional knowledge or training about how to raise a child properly. They cannot manage their anger and believe that the only way to discipline and assert control over children is to beat them". In contrast, he claimed that his exposure to both primary and secondary school had taught him about the negative repercussions of physical violence. As a result, he does not physically abuse his children.

In addition, the religious and cultural origins of fathers also influenced their violent behaviour towards their children. In Hindu Namashudra cobbler

communities, where class and caste problems take primacy, it was noticed that daughters were beaten more frequently than in Bengali Muslim families. Parents in traditional Namashudra families rarely allow their daughters to deviate from the arranged marriage pattern. Thus, fathers are pretty restrictive about their daughters' mobility, marital concerns, and partner selection choices. To preserve the family's honour and standing, fathers continually monitor their daughters and use force or threats to persuade them to adhere to family norms and ideals so as.

The practice of the caste system hinders the education of girls and the enforcement of equal rights in some countries. As members of a lower caste, members of the Nishi group claimed discriminatory caste practices and severe treatment. Given the fact that children from the Nishi community, particularly girls, are not permitted to attend the same school as other Hindu children from more affluent families, fathers typically limit their investment in their daughters' education. Since that dowry is a prerequisite in traditional Hindu marriage, fathers typically save for their daughters' weddings. As such, fathers are highly anxious about their daughters' mobility and violation of family norms or standards.

4.1.2 To Discipline Children and Raise them into Decent Human Beings

According to our fieldwork, a common perspective among fathers regarding violence towards children was that it is necessary to discipline their children in order to raise them to be good human beings. The majority of fathers believe that fear and physical punishment are essential for child management. Some believe mentoring children is the most effective way to help them understand positively. However, most believe training them to follow parental rules and regulations is more important. Fathers in Rangpur, for instance, noted in group conversation that disciplining children involves rearing them, scolding or slapping them when they misbehave, and yelling at them when they do not study adequately. Asad, in an FGD, stated that, 'Slapping or beating can make children understand what is right or wrong. If we fail to control our children from the very beginning, they will go rogue, derailed and wicked.' [Asad, FGD participant, Gangachara, Rangpur, 2016]

Two important causes of child abuse were identified in FGDs involving fathers. Children's disobedience towards their parents and other adults is one cause, while their refusal to attend school and learn lessons is another. Participants in FGDs reported that fathers endeavour to control their children to instil respect for their parents and elders. Men in Natore, Pabna, and Sirajganj were confident that mothers should be solely responsible for the care and upbringing of their children, while fathers' role should be limited to disciplining. Young fathers in Rangpur expressed that their children should be raised like their upbringing. Since they were regularly subjected to slapping, chastising, and beating by their parents, they viewed VAC as a regular form of childrearing.

In various FGDs, fathers shared that physical punishment is useful for deterring children from disobedience and managing their reckless behaviour. Some fathers believed that children must be disciplined and controlled so as not to deviate from the route to success and learn right from wrong. They felt that because children of their age were unruly, they must be disciplined and trained from birth to respect their elders. At FGDs in Mandalpara, Chaikola, and Gonaigacha, fathers frequently beat or punished their children for creating a disturbance. In another FGD, fathers identified hitting and slapping as the most effective methods for disciplining disobedient children. Momin, a father from Chaikhola, said, ‘Na mairli ki jait hobi? (Will they be disciplined if not beaten?’. [Momin, FGD participant, Pabna, 2016]

There is a strong tendency among children not to go to school in the areas studied. Due to their remote locations, most villages lack schools in their catchment areas. Hence, children from the villages frequently lack motivation to attend school. However, parents were found to be interested in their children’s education because they desire an educated and literate generation. Therefore, parents frequently scare, slap, and threaten children that they will stop feeding them if they do not continue their schooling. In several Muslim communities, parents pressure their children to attend *Maktab*’ for Islamic education and punish them if they refuse to attend.

4.1.3 Fathers’ Reluctance to Share Household Tasks and Childcare Responsibilities

In a traditional society like Bangladesh, patriarchal beliefs imply that a father’s primary responsibility is to provide for his family financially. Fathers in remote areas, in particular, have difficulty understanding how their little efforts might benefit their families. Childrearing, for instance, is primarily viewed as a feminine work within the researched areas. It was usual and anticipated that women would be solely responsible for child care and other caring responsibilities. In addition, male participants also firmly believed that only women are responsible for performing routine domestic tasks. Since men are primarily responsible for earning a living, they consider taking part in household responsibilities a “waste of energy and time” unless their wives become ill.

It has been widely noticed that men are typically uninterested in assisting their partners with post-natal care concerns. To them, it is primarily the responsibility of women, as they are preoccupied with making a living. Even those who remain at home contribute nothing to this function. Rahim, a father from Gunaigacha, said, ‘I did not even notice when and how my child grew bigger.’ Gopal Miah of Baraigram stated, “I go fishing extremely early in the morning and return late at night. Is there time to look after my child?” Alternatively, Azad of the Aziznagar

Bihari camp stated, “I make money for my family. Isn’t it sufficient? If I perform chores, what are wives expected to do?”

Field observations in Rangpur, Natore, Pabna, Sirajganj, and Cox’s Bazar indicated an alarmingly high incidence of physical and psychological abuse by fathers against their children. In certain areas, fathers’ authoritarian attitudes have presented themselves through beating, slapping, and threatening. Owing to a lack of parenting understanding, fathers frequently saw traditional child-controlling measures, such as beating and slapping, as means of restraining unruly children. While some fathers were involved in childrearing, most were observed playing with their children according to their preferences and time availability. This frequently resulted in family disputes regarding the gender-based division of labour between parents. As women are primarily responsible for childcare, their inability to manage children frequently results in their husbands’ committing acts of violence against them. As a result of this conflict, violence against women in rural poor areas became widespread. Seeing their mothers being abused by their fathers caused stress to the raising of young children, which ultimately resulted in psychological or emotional distress among them. Children who grew up witnessing their mothers being the victims of domestic violence frequently had a terrible upbringing that culminates in psychological issues in adulthood.

4.2. Ways to Prevent Violence Against Children- Some Positive Examples of Fathers’ Engagement within Families

Although violence against children is frequent among Bangladeshi fathers, our study interventions indicate that significant changes can be made to reduce VAC by involving fathers in household chores and childcare responsibilities. During our regular interactions with fathers to understand the need for positive parenting, following the end of the study, we observed some positive changes among a few fathers. In this section, we bring those narratives of positive fatherhood to show how their gradual engagement in child-caring roles generated visible changes in household dynamics as well as reducing both violence against women and children. To most fathers, consulted engagement with children during playtime is worth mentioning. They think buying toys for children or taking them out are possible ways to fulfil their duties after returning from work. To show a caring attitude towards wives, they often buy clothes or any food item during pregnancy, but fathers are seldom found to support their wives in the daily household chores.

Mominul from Katanga stated that parents should never hit or harm their children because they are the “true gifts from heaven”. The unbearable difficulties he witnessed his wife endure during her entire pregnancy helped him recognise the importance of having children in their lives. Therefore, he promised never to punish his child for whatever reason.

When asked, one of the participants, Sumon from Rangpur, said he only takes care of his child when his wife falls sick or cooks for the family. While his wife was pregnant, he took care of her and took her to the local hospital for regular follow-up. Like him, there were a few more positive cases of sharing household work and parenting with wives. Such cases must be highlighted to set examples for others in the same communities.

After finishing high school, Habibur worked as a cleaner in Chatmohor Thana of Pabna. His family is regarded as a “happy family” by the entire community. In addition to sharing the childcare obligations, Habibur also shares the household tasks. He says, “There are no feminine or masculine tasks in our house”. Habibur assisted his wife in preparing dinner. In addition to cleaning and cutting vegetables, Habibur frequently prepared meals for his family and washed dishes and family members’ clothing. Following in his footsteps, his children also shared daily chores. This family was regarded as a role model for their exemplary behaviour.

As a farmer, Bacher Molla struggled all day in agriculture to support the upbringing of his children. He also spent considerable time with his children to make them educated, self-sufficient, and family-oriented. One of his sons, Fakhrul, married Dipa, who was 14 when she was married off owing to poverty. Dipa had a lifelong desire to attain a higher education, which she told her father-in-law despite her belief that it would be in vain. Bacher took full responsibility for Dipa’s continued education and persuaded his wife and son, Fakhrul, to enable her to complete her education. As a result of such dedication and familial support, Dipa achieved exceptional grades on her Higher Secondary Certificate (HSC). However, when she was admitted to the Bachelor’s programme, she gave birth, making it difficult for her to continue her studies without family support. Bacher again intervened and inspired his wife and son to cooperate in childcare and cooking so Dipa could accomplish her dream of becoming a civil servant. While asked in the interview about the positive role of Bacher Molla in parenting, he replied that “a father is not someone who needs to be strict on their children but rather be friends with them to offer them a comfort zone. This is what every decent individual should do.”

Barochara is a remote village in Cox’s Bazaar where the majority of men are illiterate, and girls’ education is unimaginable. Md. Nasir from this village encouraged his eight children, including boys and girls, to meet the educational obstacles and shine. His unwavering support for his children and his willingness to transport them by boat to school in a nearby village influenced others in the neighbourhood. Due to his commitment and participation in household tasks, his children grew up with a basic understanding of sharing the burden of family responsibilities and caring for others.

5. Conclusion

For proper development, children need the support and guidance of their parents. Children with a loving, involved father are thought to have more pleasant childhood memories and stronger self-esteem. It is meant to enhance family peace and well-being when fathers participate in household duties and child-rearing. So, the goal of this study was to investigate how fathers' involvement in childcare work may help to lessen violence against children. In order to include fathers in caregiving at the household level, CMMS in Northern Bangladesh conducted a community dialogue session with fathers from the rural community. The research examined this session using a mixed methods approach to data collection. This research concludes that fathers' involvement in household chores and child-rearing responsibilities defies traditional fatherhood standards and diminishes the incidence of violence against children in rural households.

In this research, we tried to understand the current situation of violence against children (VAC) and how fathers' involvement can help reduce VAC in rural households. In a patriarchal society like Bangladesh, where fathers enjoy utmost control over family decisions, it is understandable that they will have the final say on the children's upbringing. The general practice of disciplining children dictates that fathers use strategies that can easily be regarded as VAC. Fathers seem to internalise such practices of disciplining children using corporal punishment as a generational practice. Most of the fathers reported that when they were children, they faced similar punishments from their parents. Unfortunately, these kinds of practices are not even usually considered by society as violent; instead, they also reinforce such abusive practices as an effective way to control and discipline the children, mainly the boys.

In the study area, we found that fathers not involved in caring for their children are more prone to commit VAC. All the households that reported that VAC is minimal at the household level have fathers involved in the children's early childhood care. The same observation also applies to fathers who regularly participate in household chores. In both cases, fathers are reluctant to admit at the societal level that they are engaged in household chores or care for their children regularly. However, they admitted they had better spousal relationships and mental peace than other fathers. They are also reluctant to admit socially that they regularly participate in household chores or care work. This indicates the strict patriarchal social rules and norms associated with the construction of masculinities and fatherhood that segregate the household as a private domain and the domain for women to take care of where men's entrance is taboo. So, these findings indicate the need for targeted intervention to create social awareness to engage men in commonly perceived deficiency areas, from providing less child support to limited involvement in domestic chores.

According to interviews with fathers engaged in household chores and childcare activities, the majority of fathers in the study locations, except a few, were unaware of the significance of their involvement in childcare. Through their participation in child-rearing tasks such as feeding and playing with children, men demonstrate an understanding of the father-child bond. Without external interventions at the societal level, it appears that it will be challenging to shift patriarchal norms, as men generally view women as accountable for domestic responsibilities.

To overcome their reluctance to share household responsibilities, they must understand how their participation might improve the family's well-being. The husband's conviction that he is morally and religiously forbidden from performing housework should also be questioned. Men should also learn to understand their partner's needs and to share the weight of household tasks and childcare responsibilities, according to our findings. Considering socio-economic class, religion, and educational level as significant determinants, women in every community studied for this research anticipated men's engagement in the family. Positive masculine figures were therefore encouraged and welcomed to serve as role models and mentors for the child in order to properly nurture and lead young children and contribute to their development in all areas. It has been emphasised that parents should discipline their children in a friendly manner as opposed to using force or threats. The ultimate responsibility for protecting children from all sorts of violence rests with family members, specifically fathers.

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Empowerment of Rural Women through Microcredit Programme of BRAC

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Abstract

This paper is about microfinance and its role in giving empowerment at the domestic decision-making level to the poorest females in Kushtia Sadar Thana. The study was designed to analyse rural women's economic and social empowerment as the outcome of microcredit interventions at BRAC. This paper investigates the nature and extent of rural women's empowerment and the factors influencing it. The paper further outlines a strategic framework for enhancing rural women's empowerment. The methodology of this study is an integration of quantitative and qualitative methods based on data collected in two villages in the Kushtia district. Ten key indicators of empowerment were chosen for this purpose. Data were collected from 80 respondents during July-August 2013 following purposive random sampling. The study concludes that education, training and exposure to information media can potentially increase women's empowerment. Therefore, effective initiatives undertaken by the concerned agencies to improve women's education, skill acquisition training, and access to information could enhance women's empowerment to achieve gender equality and development at all levels in the rural society of Bangladesh. This study also concluded that there were some positive contributions of microcredit interventions of BRAC on rural women's economic autonomy. Hence, development agencies, especially BRAC, should extend more loans to low-income women to enhance their economic solvency, domestic power relations and psychological strengths. This could undoubtedly act as a catalyst to foster the socio-economic uplift of rural women in the study villages and rectify long-standing gender inequality in Bangladesh.

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Keywords: *Empowerment of women · Microcredit interventions · Rural women's economic autonomy · Gender inequality · gender relations · Socio-economic condition.*

Abbreviations used: ADB = Asian Development Bank. BBS = Bangladesh Bureau of Statistics. BRAC = Bangladesh Rural Advancement Committee. BARD = Bangladesh Academy for Rural Development. BDHS = Bangladesh Demographic and Health Survey. CDF = Credit and Development Forum. CEI = Cumulative Empowerment Index. DFID = Depart for International Development. IGA's = Income Generating Activities. MC = Micro Credit. NGO's = Non-Government Organizations. VO = Village Organization

1. Introduction and Background

Introduction

Bangladesh is known as one of the most populated countries in the world. Its population is 14 97 72,364 (BBS, 2011), and poverty impedes development. About half of this population is women (about 7, 47, 91,978; BBS, 2011), and most are poor and live in the countryside. In this situation, empowering these rural women is the most critical issue in a developing country like Bangladesh. Women are an integrated part of society, so their status and participation in decision-making and economic activities are deficient. It causes obstacles to the advancement of poor rural women and the development of society.

Empowerment is the process of women taking control and ownership of their lives by expanding their choices. It involves undoing negative social constructions so that the affected people can perceive themselves as having the capacity and right to act and have influence (Rowlands, 1995, p. 102). Microfinance plays a significant role in improving women's decision-making through participation in economic activities. The development activities of non-governmental organisations (NGOs) in Bangladesh lead to empowerment in its social and economic dimensions. NGOs have made their microcredit programmes accessible to women because they are poor and more vulnerable than men.

Hashemi et al. (1996) show that participation in microcredit Programmes is positively associated with a woman's level of empowerment, defined as a function of her relative physical mobility, economic security, ability to make various purchases on her own, freedom from domination and violence within the family, political and legal awareness and participation in public protest and political campaigning (ADB, 1997, p. 15). Bangladesh Rural Advancement Committee (BRAC), one of the world's largest NGOs operating nationally since 1972, gear its activities towards alleviating poverty and empowering rural women.

This paper explores the socioeconomic determinants of women's empowerment, focusing on the women who have availed themselves of the BRAC microcredit programme.

Statement of the Problem

In Bangladesh, about 80 percent of the population lives in rural areas, and women constitute almost half of the population (BBS, 2011). These rural women suffer from abject poverty and also socio-economic inequality and gender disparity prevalent in the society (Ahmed et al., 2011).

A large number of the hardcore poor in rural areas are the widowed, divorced and abandoned women who have no bread earner. They are the most deprived section in society. It is commonly known that these rural women have no proper education and knowledge of development.

In this situation, it is necessary to empower these rural women to enhance their abilities and become self-reliant. Micro-credit is one of the common ways to get rid of poverty and enhance their power and productivity. Given the socio-economic condition of our country, the micro-credit Programmes of different organisations often significantly change women's socio-economic status. It has enlightened their lives and made them self-confident, as they can provide income to the households and participate in decision-making in the family.

In this context, the empowerment of rural women is considered an important issue in Bangladesh. This study investigates how the micro-credit programme benefits rural women.

Rationale of the Study

The vast importance of the empowerment of rural women through micro-credit is highly acknowledged by researchers, economists, scholars, educationists and practitioners. It is conceivable that, with all the necessary support and materials, a woman can participate in income-generating activities and support her family and society. We cannot deny that without the development of this sizeable female section of the country, the absolute development of the country is not possible. So, to ensure the country's socio-economic growth, women's autonomy is very requisite. This study investigates how female borrowers have been affected by the micro-credit model in terms of their mobility outside the home, personal efficacy, and economic self-determination within marriage and families. It also investigates whether BRAC has succeeded in these poverty alleviation programmes by empowering women.

Objectives of the Study

- To explore various determinants of women's economic and extra-economic status.
- To analyse microfinance's role in improving women's decision-making power at the domestic level.
- To investigate the impact of women's participation in micro-credit Programmes on their mobility.
- To assess whether the investigation has any effect in reducing domestic violence against women.
- To analyse the influence of the micro-credit Programme on the socio-political awareness and legal knowledge of the participating women.
- To identify the problems faced by the women borrowers and micro-credit personnel.
- To make some recommendations to solve these problems.

Significance of the Study

Various social impacts and significance have been intertwined with micro-credit. The concept of lending in micro-credit has developed leadership roles for women who are given facilities from micro-credit institutions. In our country, most women are treated as housewives and are only responsible for household chores. So, BRAC's approach toward the loan system brings additional social benefits.

Micro-credit empowers women and significantly impacts combating poverty among poor people. Micro-credit institutes like BRAC provide poor women with different financial services, such as savings, credits, etc. So, from the above discussion, we can say that this research problem is of great significance.

Microfinance is a banking service that provides low-income or unemployed people access to financial and non-financial services. Microfinance is a powerful tool for self-empowering poor people, especially women, at the world level and especially in developing countries. Microfinance activities can give them a means to climb out of poverty. Microfinance services lead to women's empowerment by positively influencing women's decision-making power at the household level and their overall socioeconomic status.

2. Literature Review and Conceptual Framework

There is a great assortment of literature on the different aspects of encroachment evaluation of micro-credit. Many studies have also attempted to examine women's empowerment, focusing on methodological issues, empirical analysis, and different measures and tools of empowerment. In this research work, I have been concerned

with the studies of women's empowerment and the impact of microfinance.

Women's empowerment is an essential precondition for the elimination of world poverty and the upholding of human rights (DFID, 2008: 8). An influential hypothesis regarding women's empowerment that has dominated and the rationale of development Programmes targeted at women, especially microfinance, views the effect of access to financial services like credit on women's empowerment as a set of mutually-reinforcing 'virtuous spirals' of increasing economic empowerment for women (Mayoux, 1999).

Hunt and Kasynathan (2002) described that microfinance Programmes for women positively impact economic growth by improving women's income-generating activities. The data was collected from three NGOs in Bangladesh and one state from India. The study found that most women receiving credit have no control over their loans due to low market access. It was further found that micro-credit has an impact on female education, marriage practice, mobility, violence against women and self-respect. Moreover, microfinance, designed for the poorest, did not reach the poorest people. So, donors and NGOs must concentrate on credit access to the poorest people.

Malhotra et al. (2002) worked on conceptualising and operationalising empowerment rather than reviewing its indicators. They highlighted empowerment's economic, social, familial/interpersonal, legal, political and psychological dimensions. Empowering themselves is not only the responsibility of individual women. Government Moreover, other institutions should promote policies that ensure gender equity through political and legal reforms.

Asim (2008) evaluates the microcredit Programme's impact on women's empowerment indicators. The author has chosen specialised institutions with women-focused models. Three potential sources of selection biases measured the impact of the Programme. Firstly, Programme participants are different from their control comparators. Second, the treatment group might differ from the control group regarding the distribution of unobserved characteristics. Third bias can arise if participants have positive externalities on those who have later joined the Programme. The author constructs preference-based indicators, including child-related and health-related decisions and economic decisions, social mobility decisions, resource-allocated decisions and autonomy-based indicators, including household purchase and child-related decisions. To explore the link between women empowerment and microcredit participants, the author used three different estimates: simple parametric framework of conditional mean independence, randomisation of treatment and bivariate probit model. The results show that micro-credit intervention does not impact child-related, health-related, economic and social mobility decisions. On average, women in the treatment

group were no more independent or autonomous than the control group in small household purchases. Participation in the micro-credit Programme was found to be insignificant in explaining all the outcome indicators of empowerment.

Chaudary and Nosheen (2009) narrated that women's empowerment is an essential issue in development policies in underdeveloped countries.

Since empowerment is a multidimensional concept, it is determined by many socioeconomic factors and cultural norms. The authors attempted to explore the determinants of women's empowerment using regression analysis. The data was collected from Southern Punjab, predominantly rural and tribal areas. The status of women was found to be very vulnerable in rural and tribal areas, and they had minimal access to all basic facilities. For women's empowerment, four indices were developed to make a cumulative index. The results show that age, marital status and Islamic views statistically positively impact women's empowerment.

Cheston and Kuhn (2002) stated that microfinance programmes can potentially transform poor relations and empower women, especially using a Sinapi Aba Trust case study. Although women's access to financial resources has substantially increased, loans given to women differ in size. Despite this, financial help alone is not enough to empower women and improve their well-being. However, if they are correctly designed, then they make an essential contribution to women's empowerment. The writer explains empowerment indicators and measurement techniques. The contribution of micro insurance, saving to empowerment, technology transfer through microfinance institutions, and the relationship between microfinance programmes, empowerment, family planning, and cultural norms exist. He describes different theories of targeting women. Microfinance plays a significant role in gender and development strategies because of its direct relationship to both poverty alleviation and women. As women are the poorest of the poor, greater financial security allows them to become more empowered in household and community affairs. Women spend most of their income on family needs, particularly children's education, diet, health care and clothing. Proponents of targeting women argue that women's repayment records are reasonable and their behaviour is more cooperative than men's. Access to financial resources does not alone empower women but also access to material (credit, property, and money) and human and social resources (education, business). Empowerment is a culturally relevant term, not a Western concept. Microfinance affects women's ability to make decisions and self-confidence, which are closely linked with knowledge, women's status, and gender relations at home. Microfinance Programme strengthens women's economic autonomy and allows them to pursue non-traditional activities. Through these Programmes, women escaped from abusive relationships. Purdah also confines their activities to their homes. Mobility

has also increased. Microfinance Programmes also impact political empowerment and women's rights.

The mechanics of microfinance in Bangladesh have been focused on by Rehman and Khan (2007). From the client's perspective, they explored how microfinance helps poor people improve their living standards. They concluded that the provision of microfinance in the form of collateral-free loans is an effective mechanism for poverty reduction to improve health, education, legal rights, sanitation and other living standards. Microfinance Programmes target women, the most vulnerable part of society, who live in households with no assets. By providing them with opportunities for self-employment, these Programmes can improve women's security, autonomy, self-confidence and status within the household, improving their empowerment.

Hashemi, Schuler and Riley (1996) stated that involvement in credit Programmes empowers women by providing them the impetus to make economic contributions to their households, gain a voice in familial decision-making, make large and small purchases, increase their interactions with the outside world as well as protest political and legal injustice. They used eight quantitative indicators to show the participation of rural women in the micro-credit programme.

Poverty and vulnerability are linked together. Vulnerability can be reduced through an increase in income-generating activities. In his study on assessing poverty and vulnerability, Zaman (2009) interviewed 1072 respondents in his sample in Bangladesh. The evidence on reducing vulnerability was somewhat more straightforward. He found that the provision of microcredit was a factor in strengthening crisis coping mechanisms, diversifying income-earning sources, building assets, and improving the status of women. Thirty-six villages in Bangladesh showed that membership in any microcredit organisation positively linked with women's decision-making role, control over resources, and mobility.

Suguna (2006) stated that economic empowerment is the initial aspect of women's development. Economic empowerment means greater access to financial resources inside and outside the household. It is also linked with reducing the vulnerability of poor women in crises like famine, food crisis, riots, death and accidents in the family. Economic empowerment allows women to retain income and use it at their discretion. The researcher has also stressed the establishment of self-help groups (SHGs) for women's empowerment.

Rahman et al. (2009) conducted a study on the impact of micro-credit Programmes on higher-income borrowers in Bangladesh. The primary focus of the study was to estimate the impact of micro-credit on various household outcomes, such as income and assets. The researchers used primary data collected through a structured questionnaire from borrowers of two major micro-credit institutions

in Bangladesh, Grameen Bank and BRAC. The results showed that the micro-credit Programmes effectively generated higher income and assets for borrowers in general. However, the impact was not found to be uniform across the income levels of borrowers. Higher-income borrowers seem better off than middle- and lower-income borrowers. It was also observed that some other factors, like the age and education of the household head and his/her partner in the family, were significant and impacted the household better.

Ahmed et al. (2011) present a case study on how the microcredit Programme contributes to the poverty reduction of rural households. This study is employed in two study areas to compare the socio-economic status of rural women, e.g. 'with credit' and 'without credit' rural women. The paper also provides facts and comparisons of poverty's incidence, intensity and severity among the 'with credit' and 'without credit' respondents' households. They have shown that the incidence, intensity and severity of poverty among the households with credit are 79.5, 27.6 and 11.53%, respectively. On the other hand, 'without credit' households suffer a higher level of poverty in terms of incidence (99.0%), intensity (58.70%) and severity (37.10%) than the 'with credit' households. The study suggests that after joining the Grameen Bank's microcredit Programme, rural women have been able to engage in income-generating activities and consequently significantly reduce their poverty situation.

Parveen and Chaudhury (2009) stated that women's economic empowerment can be improved by increasing their income, savings, and assets. The study was conducted in Shahjatur and Jalalpur villages under Melandaha Upazila of Jamalpur District. A total of 90 respondents were selected through a stratified random sampling method, of which 45 were involved in the credit scheme of the BRAC and the other 45 women had no involvement in any credit Programme. Both qualitative and quantitative data were collected. Three indicators- personal income, savings, and assets, were considered to measure women's economic empowerment. The independent sample t-test was performed to evaluate the impact of micro-credit on women's economic empowerment. Results showed significant differences between BRAC and non-BRAC women in the economic dimensions of empowerment. The study shows that the mean value of BRAC women's empowerment varied significantly from the non-BRAC women group was significant. BRAC women's economic empowerment level is higher than that of non-BRAC women. The results also suggest the need to empower women through education. In enhancing women's empowerment in a significant way, the concerned agencies, especially the BRAC, should provide more loans to poor women along with the provision of education and training.

Nanda (1999) researched women's participation in rural credit programmes in Bangladesh and their demand for formal health care to measure the impact of credit to ensure that it is positive. She used a sample of 1798 households by random sampling of 87 districts. It was highlighted that women's empowerment through participation in credit Programmes results in greater control of resources for their demand for formal health care. As a result, when women are economically productive or empowered, that changes women's lives. It also improves their decision-making power regarding health-seeking behaviour and other household issues. The researcher's finding shows that microcredit positively impacts the demand for formal health care. That is because women are economically empowered and can make health decisions. Through micro-credit, when women improve their productivity, information and mobility, all these are mechanisms for their empowerment. The research of Nanda and the present research are similar in that both basically focus on women's economic empowerment. That further improves their well-being and formal health care.

Pitt and Khandker (1999) studied in Bangladesh to see whether microcredit empowers women. They examine the effects of men's and women's participation in group-based micro-credit Programmes on various indicators of women's empowerment. Data was used from a unique survey carried out in rural Bangladesh. Findings show that micro-credit programmes help to increase women's empowerment. They also concluded that credit Programme participation leads women to take a more significant role in household decision-making, have greater access to financial and economic resources, have more significant social networks, have greater bargaining power vis-à-vis their husbands, and have greater freedom of mobility. The present study is linked with the study mentioned above because the researcher also wants to explore the impact of microcredit on women's empowerment.

Parveen and Leonhauser (2004) studied that rural women belong to the most deprived section of society, facing adverse conditions in terms of social oppression and economic inequality, a visible majority of them being impoverished. This paper investigated the nature and extent of rural women's empowerment and the factors that influence it. Six key indicators of empowerment covering three dimensions were chosen for this purpose. A cumulative empowerment index (CEI) was developed by adding the scores of six obtained empowerment indicators. The study concludes that education, training and exposure to information media can potentially increase women's empowerment.

Mahmud (2003) reassessed the effect of micro-credit Programme participation on women's empowerment by applying an analytical framework that recognises the conceptual shift in emphasis on the definition of empowerment, from notions

of greater well-being of women to the notion of women's choice and active agency in the attainment of greater well-being. She found that micro-credit Programme participation has a limited direct effect on increasing women's access to choice-enhancing resources but has a much stronger effect on increasing women's ability to exercise agency in intra-household processes.

Malik and Luqman (2005) described that three arguments are used to prioritise women's access to micro-finance services: poverty, increased efficiency and sustainability, and equality in empowerment. Micro-credit programmes tend to focus on promoting changes at the individual level. It involves increased well-being, access to resources, self-confidence, self-esteem and respect, decision-making and bargaining power participation, and increased control over benefits and their lives. It was concluded by considering the previous studies that micro-credit schemes no doubt facilitate empowering poor women and eradicating poverty, but they also negatively impact women's empowerment.

From the above literature reviews, it can be concluded that the micro-credit programme of different organisations plays a significant role in empowering rural women, helping to remove their poverty, and allowing them to participate in the decision-making of their families. However, some studies have said that although micro-credit positively empowers women, rural women face difficulties participating in income-generating activities. Because most of these rural women are illiterate and they do not have the basic education and training facilities.

Other obstacles to empowering rural women through the micro-credit Programme are our country's socio-cultural and religious superstitions, which prevent rural women from participating in income-generating activities.

Above all, if rural women are eager to change their life status and have a minimum education and confidence, they can properly use the loans and provide themselves with a better life.

Conceptual Framework

Women empowerment is a multi-dimensional social process that helps women gain control over their own lives. It is a process that fosters power in people for use in their own lives, their communities and their society by acting on issues they define as important. It refers to increasing the spiritual, political, social, educational, gender, or economic strength of individuals and communities. It is essential to reduce poverty, gender discrimination, and violence against women and uphold human rights. In Bangladesh, only 20% of women work for cash, and among them, only 48 percent can spend their money on their own; the rest depend upon husbands or other family members to make joint decisions on spending (BDHS, 2004). So, there is no other way for rural women to get social

and economic freedom without empowerment and in this situation, micro-credit plays a vital role in Bangladesh.

Micro-credit has become a buzzword among development practitioners. Micro-credit has been proven as an effective tool for the creation of assets, income generation and facing the income-stock of the poor. Several non-governmental organisations (NGOs) have pioneered credit delivery mechanisms for the poor in Bangladesh and abroad, which consist of small amounts of collateral-free loans. Micro-credit in Bangladesh originated in the programme developed for small farmers and landless people by the Bangladesh Academy for Rural Development (BARD) in 1976. In the same year, Grameen Bank started its activities as a demonstration project. According to the Credit and Development Forum (CDF), up to March 2005, as many as 720 NGOs were operating the Micro-Credit Programme in Bangladesh to reduce poverty, and one-third of the families in rural Bangladesh were beneficiaries of Microcredit Programmes.

Bangladesh Rural Advancement Committee (BRAC) is one of the largest NGOs in the world and has been a pioneer in NGO activities in Bangladesh since 1972. Its main goal is to alleviate poverty and empower the rural poor, especially women. It aims to increase women's social status and economically and socially empower them.

This study includes rural women's economic and social empowerment through the Micro-Credit Programme of BRAC. Economic and social empowerment are interlinked, dynamic, and mutually reinforcing at the household level. The economic empowerment provides household welfare, access to economic resources and ownership of productive and non-productive assets. On the other hand, social empowerment refers to the participation in gender awareness about basic rights, self-confidence, bargaining power, freedom of choices and coping abilities within households.

Different researchers have researched the impact of micro-credit on women's empowerment in Bangladesh, and different indicators have been used to measure empowerment. Parveen and Leonhauser (2004) comprehensively used six indicators of women's empowerment: Contribution to household income, Access to resources, Ownership of assets, Participation in household decision-making, Participation in gender awareness, and Coping capacity in household stocks. Using these indications, they made a cumulative empowerment index and measured women's empowerment in Bangladesh.

Similarly, Noreen (2011) used five indicators in her research, i.e., decisions on child health, education, selection of spouses of children, and loan use taken by herself/ jointly by her husband/ her husband only. She constructed a simple index and measured empowerment. In one study, access to credit was seen as

empowering because the outcome ‘increased income earning time spent in credit-based activities’ was assumed to lead to greater influence in household decision-making automatically but without providing any evidence of a positive relationship between women’s role in household decisions and time spent in market production (Pitt & Khandker, 1995). By contrast, the outcome ‘use of loans by male relatives’ was interpreted in another study as a loss of women’s direct control over loans and seen as reinforcing unequal gender relationships, so access to credit was interpreted as disempowering (Goetz & Gupta, 1996).

In this research paper, we intend to show the impact of micro-credit on empowering rural women and their economic and extra-economic status in society. Although much research has been carried out on this issue, the influence of education status, consciousness of women and their families, and necessary training that empowers women efficiently through micro-credit can be investigated further. Keeping all these in view, we have used ten different indicators to measure women’s empowerment through the micro-credit Programme of BRAC in Kushtia Sadar Upazila. The indicators are:

- 1) Involvement in income-generating activities (IGAs): Involvement in IGAs means women’s involvement in household income and economic contribution to their family welfare and reduces dependency on husbands. It refers to the wife’s contribution in terms of per cent involvement in subsistence productive activities that are not rewarded in cash or kind to household income (Parveen & Leonhauser, 2004). These activities can be Farming and non-farming activities such as small business, handicraft production, service, etc.
- 2) Access to resources: Access to resources refers to the ownership and control over productive and non-productive resources. Productive resources are generative assets, i.e., land, cash, cattle, poultry, etc.; non-productive resources include furniture, jewellery, television, radio, small vehicles, etc. It is vital in determining a person’s bargaining power within the household and the wider community (Mishra & Dale, 1996). It provides the right, scope, power and permission to use and get advantages from household resources such as handling and spending money, having nutritious foods and social resources such as education, training, rural cooperatives and banks.
- 3) Decision-making power: Decision-making power means the extent to which women can participate in formulating and executing decisions regarding domestic, financial, child welfare, reproductive health, farming, and socio-political matters in coordination with other family members (Parveen & Leonhauser, 2004). It is the most important determinant of women’s empowerment.

- 4) **Purchasing power:** Purchasing power significantly enhances women's empowerment. It allows women to spend freely on land, cattle, goats, food, clothes, furniture, and cosmetics. It provides economic independence for women and makes them self-confident.
- 5) **Mobility:** Mobility is considered one of the critical indicators of women's empowerment, which states the extra-economic status of rural women. It indicates the freedom of movement and travel contrary to social and religious restrictions of rural women who consider going outside, like NGO offices, local markets, health centres, banks, natal homes, and relatives' homes.
- 6) **Domestic violence:** Domestic violence measures the empowerment of women. The socio-cultural environment of our country causes different violence against women, like taking money, land, and other assets against the willingness of women, physical abuse, prevent from doing work own willingness and prevent to go outside.
- 7) **Gender awareness:** Gender awareness refers to a woman's ability to express her opinion regarding gender inequality and discrimination against women in society. Some crucial gender issues can be pointed out, such as son preference, attitude toward female children, feeding priority, under-value, education, inheritance property rights, early marriage, dowry, divorce rights, wage discrimination, etc.
- 8) **Protest against injustice:** Another critical indicator of women's empowerment is protesting all domestic and social injustices. Women can raise their voices individually and collectively through law to protest injustices. They can demand justice from the court, the union chairman, relatives, and the family's adults.
- 9) **Political and Legal knowledge:** Women must have a general knowledge of politics and law to empower themselves. Some critical issues can be considered indicators of empowerment regarding political and legal knowledge, such as knowing the name of the Prime Minister of our country, the name of the local chairman, knowledge about dowry, early marriage, divorce, participation in voting during elections, the legal age of marriage, etc.
- 10) **Education and Health awareness:** Education and health awareness are the most important determinants of women's empowerment. Education enhances the power of raising voices, makes them able to know themselves, and increases their self-confidence and awareness. On the other hand, health is the root of all happiness. So, health awareness is also

an essential ingredient of women's empowerment. A healthy family can provide a healthy nation.

Using this conceptual framework and these ten specific indicators, we have tried to determine whether MC helps rural women increase their empowerment.

3. Methodology

Research Approach

In this study, we have used an integrated research approach. We adopted a combination of qualitative and quantitative research approaches as qualitative and quantitative data have been used for the study. The qualitative approach and the quantitative approach are the two paradigms of research followed in various fields such as sociology, anthropology, psychology, and so on. The purpose of quantitative research is to generalise about the phenomena. It involves collecting and analysing numerical data from tests, questionnaires, checklists and surveys. On the other hand, qualitative research provides in-depth descriptions of the setting and people. It involves collecting and analysing non-numerical data from observation, in-depth interviews, tap recording and document analysis.

I used both qualitative and quantitative research approaches for the study. This study is based on primary data collected from household investigations and secondary data used for necessary comparisons.

For the primary data collection, two groups of women from two villages were deliberately selected, and their socio-economic conditions were the same. A total of 80 participants were divided into two groups according to involvement in income-generating activities in the BRAC of the micro-credit Programme and non-beneficiaries of the micro-credit Programme of any organisation.

Research Site

We have selected the BRAC area office for the Kushtia branch. For the study's investigation, I have selected two villages in Sadar Thana in the Kushtia district. These villages are Kumargara and Jogoti, and they are about 5 kilometres away from the town of Kushtia district.

Sample Design

For the primary data collection, I selected 80 respondents who were all rural women, and their socio-economic conditions were similar. Then, I divided these women into two groups. The first group, Group 1, consisted of 45 rural women involved in income-generating activities through BRAC's micro-credit Programme.

On the other hand, the second group, Group 2, consisted of 35 rural women who were not involved in IGAs or were not involved in IGAs but were not in any organisation's micro-credit Programme.

The research uses the purposive sampling method. The list of beneficiary women is collected from the current micro-credit Programme of the women's registrar of the BRAC area office.

Methods of Data Collection

In this study, both qualitative and quantitative data have been used for the investigation. Therefore, primary and secondary data have been collected.

Primary data were collected through semi-structured interviews, focus group discussions, and household surveys. A questionnaire, including fixed- and open-ended questions, has been constructed. Different publications, research papers, journals, books, periodicals, and Internet publications were used for secondary data collection.

Different statistical tools and methods were applied to analyse qualitative and quantitative data collection. All relevant protocols and strategies to collect the data and interview were maintained. First, we developed a field plan for the interview and data processing. According to the field plan, we collected the relevant data.

At first, we selected some relevant indicators of women's empowerment, and then, according to these indicators, we chose different questions and made a questionnaire. After that, we used a purposive sampling method for data collection at the primary level. We selected 80 respondents and divided them into two groups. The first group included 45 rural women involved in IGAs through the MC Programme of BRAC, and the second group included 35 rural women. Among those, some were not involved in any IGAs, and some were involved in IGAs but had no involvement in the MC Programme of any organisation.

We obtained different categorised information using in-depth interviews and focus group discussions and coded it as necessary. Then, we summarised the different coded data and determined the percentage of these data. Using comparisons between the specific groups, we tried to show the results of particular analyses.

Data Analysis

After collecting the required data ideally, we analysed them empirically. From the data analysis perspective, qualitative analysis differs from the quantitative approach (Creswell, 1994). We used qualitative and quantitative data, so we analysed the data in two different ways.

For the qualitative data, we have used typology and content analysis methods. Typology is a classical data analysis system where the data are classified according

to general type. On the other hand, the content analysis method suggests looking at documents, texts, or speech to see what themes emerge, what people talk about most, how themes relate to each other, and find latent emphases and meaning (Weber, 1990).

For quantitative data analysis, we have used univariate and multivariate methods. The univariate data analysis is a single-variable method. The simplest form of single-variable analysis is to count the cases in each category (Islam, 2008). On the other hand, multivariate analysis permits a researcher to study the effect of controlling for one or more variables.

Considering the conceptual framework, we have done some activities simultaneously, which were part of the data analysis, such as sorting and coding information into categories, formatting the information and writing a report. In this study, the impact of MC on women's empowerment was shown by comparing the socio-economic status of Group-1 households with that of Group-2 households in terms of selected indicators' economic and extra-economic aspects. We tried to maintain the ethical values and concerns in this study.

Validity and Reliability of Data

We have tried to show that this study is valid and reliable from the research perspective. We believe that the instrument measured through the interview is valid. On the other hand, the study is reliable because if anyone in the same field used the same instruments, they would find the same results.

As the interview was our main data collection instrument, we created a semi-structured questionnaire that was logically interrelated with the research topic and conceptual framework.

Keeping field notes and journals, we explored the participants' experiences, mainly concerning women's empowerment. We asked questions to the interviewees and asked further questions to articulate the provided statement clearly. The participants expressed their views and experiences frankly. In these ways, we have tried to make the study valid and reliable.

Limitations of the Study

We have tried to make a suggestive study, but there are some limitations also. The limitations of the study can be pointed out below:

- As the study was part of a Master's Programme (of one of the authors), I was given only three months. It was a great challenge to make a quality study within this short time.
- The topic of this research is a big issue and is very important to the rural women of our country. In this study, I had to choose only 80 respondents

representing only a tiny part of our country.

- Because of the short time, I conducted the interviews in a very short time, which can affect the data. It would be better if I could spend more time with the respondents.
- I have selected two villages of Kushtia Sadar Thana, representing a small part of the socio-economic condition of our country's rural women. These small populations cannot show our country's actual condition.
- Financial aid is needed to prepare this type of thesis. Without sufficient financial support, various types of analysis were not possible.
- Sometimes, the time and situation of the interview did not favour the study.
- One limitation of the study was the respondents' illiteracy. Sometimes, they did not give the correct information or serve properly.

Despite these limitations, I tried to overcome them and believe that the study has successfully empowered rural women through MC.

4. Results and Discussion

Findings and Results

This study aims to determine the impact of micro-credit on rural women's empowerment. In this study, I have tried to find out whether the BRAC micro-credit Programme increases the rural women's social and economic empowerment in Kushtia district. In this chapter, we have tried to present the study's findings regarding identified indicators of women's empowerment. The relevant findings are as follows:

1. Involvement in IGA's

Involvement in income-generating activities of rural women is the primary determinant of economic empowerment. It reduces women's dependency on male family members and allows them to contribute income to their families. Table 1 shows the monthly income contribution to the households of Group 1 and Group 2. Here, Group 1 is involved in the MC Programme of BRAC, and Group 2 is not involved in the MC Programme of any organisation but is involved in IGAs.

*Table 1: Monthly income contribution to the households.
(Number of respondents & Percentages)*

| Monthly Income Range (TK) | Group-1 | Group-2 |
|---------------------------|-------------|-------------|
| 500-1500 | 15 (33.33%) | 21 (60%) |
| 1500-3000 | 17 (37.78%) | 9 (25.71%) |
| 3000-5000 | 13 (28.89%) | 5 (14.29%) |
| Total | N=45 (100%) | N=35 (100%) |

Here, we have divided The monthly income from 500-5000 TK into three categories. In the first category, 15 women earn 500-1500 TK monthly from group 1, whereas 21 women earn the same amount as group 2. In the second category, 17 women earn 1500-3000 TK monthly from Group 1, and only nine earn the same monthly amount from Group 2. In the third category, 13 women earn 3000-5000 TK monthly from group-1, whereas only five women of group 2 earn the same amount.

The above table shows that around 33.33% of women in group 1 have earned monthly 500-1500 TK, those who are involved in the BRAC MC Programme, whereas 60% of women in group 2 have earned the same amount of money, those who are not involved in any organisation's MC Programme.

However, when the monthly income increases, the number of involvements of Group 1 increases more than that of Group 2. About 37.78% of women earn 1500-3000 TK monthly for the MC Programme of BRAC, whereas only 25.71% of women in group 2 earn the same amount. On the other hand, 28.89% of women earn monthly 3000-5000 TK group-1, and only 14.29% of women in group 2 earn a similar amount of money. From the above table, it is clear that the women involved in the micro-credit Programme earn more money than those not involved in the MC Programme. So, the income contribution of Group 1 is higher than that of Group 2. Therefore, it can be said that the involvement in IGAs of the beneficiary group (group-1) of the MC Programme is more than that of the non-beneficiary group (group-2).

2. Access to resources

In this study, to measure rural women's access to resources, we have used the ownership of some selected resources/assets after joining IGAs and then divided them into six categories: land, Cattle, Goat, Poultry, Other resources, and no resources. Table 2 represents the ownership of women's assets after joining IGAs. Here, group 1 is the beneficiary group of the BRAC micro-credit Programme, and group 2 is the non-beneficiary group.

*Table 2: Ownership of resources after joining IGA's.
(Number of respondents & Percentages)*

| Resources | Group-1 | Group-2 |
|--------------|--------------|--------------|
| Land | 6 (13.33%) | 3 (8.57%) |
| Cattle | 14 (31.11%) | 10 (28.57%) |
| Goat | 12 (26.67%) | 9 (25.71%) |
| Poultry | 6 (13.33%) | 4 (11.43%) |
| Others | 2 (4.44%) | 1 (2.86%) |
| No resources | 5 (11.11%) | 8 (22.86%) |
| Total | N= 45 (100%) | N= 35 (100%) |

The above table shows that, out of 45 MC Programme beneficiaries, six women have land ownership, and out of 35 women, only three non-beneficiaries of the MC Programme have land ownership.

Out of 45 beneficiaries, 14 women have cattle; out of 35 non-beneficiaries, ten own cattle. The third category shows 12 women in Group 1 have goats, whereas nine women in Group 2 have goats.

Similarly, in group 1, 6 women have poultry as an asset after joining the MC Programme, and only four women in group 2 have poultry. Out of 45 women, 2 have other resources of group 1, and out of 35 women, only 1 has other resources. According to the last category, five women have no resources in Group 1; on the other hand, eight women have no resources in Group 2. If we calculate the percentages of these results, we can compare that 13.33% of women have land in group 1, whereas only 8.57% of women own land in group 2. 31.11% women have cattle of group-1 whereas 28.57% of women have cattle of group-2. It also shows that 26.67% of women have goats, 13.33% of women have poultry, and 4.44% have the other resources of the MC Programme as ownership. In contrast, only 25.71% of women have goats, 11.43% of women have poultry, and only 2.86% have other resources of group 2. It can be pointed out that 11.11% of women in group 1 have no resources, whereas 22.86% of women in group 2 have no resources, i.e. double the amount of group 1. Comparing these results within the two groups, it is clear that Group 1, those involved in the MC Programme of BRAC, has higher assets than Group 2, those not involved in any MC Programme.

3. Decision-making power

Women's participation in household decision-making is one of the most important indicators of women's empowerment. For the study, we have selected five individual indicators to measure women's empowerment: making decisions about

children's education and marriage, household utensils, clothing purchases, and large purchases like land and long-lasting households. According to these five indicators, I have tried to determine the decision-making power of rural women in households. Here, decision-making power means making decisions individually and with their husbands or women.

*Table 3: Decision-making power of women.
(Number of respondents & Percentages)*

| Decision-making variables | Group-1 | Group-2 |
|---|-------------|-------------|
| Education of children | 41 (91.11%) | 30 (85.71%) |
| Marriage of children | 26 (57.78%) | 18 (51.43%) |
| Household utensils | 39 (86.67%) | 22 (62.86%) |
| Cloth purchase | 40 (88.89%) | 28 (80%) |
| Large purchase (land, long-lasting households) | 20 (44.44%) | 7 (20%) |

In the above table, I have compared five specific indicators within the two groups of rural women (Group 1 and Group 2). Here, group 1 consists of 45 rural women involved in the BRAC MC Programme, and group 2 consists of 35 rural women who are not involved in any MC Programme but are involved in IGAs like cattle, poultry, vegetable cultivation, stitching, etc.

From the above table, we can see that, in group 1 out of 45 women, 41 women have decision-making power in children's education, and in group 2 out of 35 women, 30 have decision-making power in children's education.

In group 1, 26 women can decide on their children's marriage with their husbands and other family members. On the other hand, only 18 women in group 2 have the power to decide about their children's marriage. Taking decisions in household utensils, in group 1, 39 women have the power of decision-making individually and with their husbands; in group 2, only 22 women have that power. In decision-making regarding purchasing clothes, 40 women in Group 1 have the power to make decisions, and only 28 women in Group 2 have the same power.

Only 20 women of group 1 can make decisions with their husbands about large purchases like lands and durable households. In contrast, only seven women of group 2 have power over their husbands.

Now, drawing the percentages of these results, we can see that 91.11% of women in Group 1 and 85.71% of women in Group 2 have the power to make decisions on their children's education. 57.78% of women in group 1 and 51.43% of women in group 2 can decide on their children's marriage with their husbands

and other family members. For small purchases like purchasing clothes and other household utensils, 86.67% of women in group 1 have the power of purchasing household utensils. In contrast, only 62.86% of women in group 2 have that decision-making power. 88.89% of women in group 1 and 80% in group 2 can decide to purchase clothes of their own will.

For large purchases like lands and durable households, 44.44% of women in group 1 and only 20% of women in group 2 have the power to make decisions to purchase large products individually and with their husbands. Finally, we can see that, on average, group 1 has more decision-making power than group 2.

4. Purchasing power

The purchasing power of different products is considered an important indicator of women's empowerment. Here, we have considered some products purchased by women and then divided them into three categories. Category 1 includes land, cattle, goats, and poultry. Category 2 includes foods, clothing, jewellery, and other products such as cosmetics, medicines, etc. Category 3 considers the purchasing power of products purchased by rural women.

Table 4: Purchasing power of women. (Number of respondents & Percentages)

| Purchasing power of | Group-1 | Group-2 |
|-------------------------------------|-------------|--------------|
| Land, Cattle, Goat, Poultry | 15 (33.33%) | 3 (8.57%) |
| Food, Clothing, Jewellery and other | 24 (53.33%) | 18 (51.43%) |
| No purchasing power | 6 (13.33%) | 24 (68.57%) |
| Total | N=45 (100%) | N= 35 (100%) |

From the above table, we can see that 15 women in Group 1 can purchase land, cattle, goats, and poultry, whereas only three women in Group 2 can. In Group 1, 24 women have the purchasing power of food, cloth, jewellery, and other products, whereas only 18 women in Group 2 have the same power.

Out of 45 rural women in group 1, only 6 have purchasing power, but in group 2, out of 35 women, 24 have purchasing power. This number of women in Group 2 is very large compared to Group 1.

Drawing percentages of these results, we can see that only 13.33% of women of the beneficiary of the MC Programme of BRAC group (group-1) have no purchasing power, whereas 68.57% of rural women in the non-beneficiary group (group-2) have no purchasing power products by their own will. 53.33% of rural women in Group 1 have the power to purchase food, clothing, jewellery and other products, whereas 51.43% of rural women in Group 2 have the same power. In

Group 1, 33.33% of women can purchase land, cattle, goats and poultry, whereas only 8.57% of women in Group 2 have the power to purchase these products. So, it is clear that those women involved in the MC Programme have more purchasing power of products than those of Group 2.

5. Mobility

Due to social norms and superstitions, women's mobility is restricted in our country. Even after that, the mobility of rural women is considered one of the critical indicators of empowerment. Women have to go outside for different reasons, and after joining IGA, their mobility increases. When a woman becomes involved in IGA, she must travel to different places, such as banks, NGO offices, and training centres. Similarly, after joining the MC Programme of BRAC, women have to go to required places such as the BRAC local office, different places within the village to attend meetings and perhaps to the BRAC training centre in a district town for training. In this study, we have selected four different places to go and constructed five mobility variables. We also considered the mobility of going outside of rural women as alone and with others.

Table 5: Mobility of women. (Number of respondents & Percentages)

| Places | Group-1 | | Group-2 | | | |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Local market | Alone | 14 (40%) | 35 (77.78%) | Alone | 6 (23.08%) | 26 (74.29%) |
| | With others | 21 (60%) | | With others | 20 (76.92%) | |
| NGO office | Alone | 14 (31.82%) | 44 (97.78%) | Alone | 0 | 2 (5.71%) |
| | With others | 30 (68.18%) | | With others | 2 (100%) | |
| Health center | Alone | 6 (16.67%) | 36 (80%) | Alone | 5 (25%) | 20 (57.14%) |
| | With others | 30 (83.33%) | | With others | 15 (75%) | |
| Natal home | Alone | 16 (39.02%) | 41 (91.11%) | Alone | 5 (20%) | 25 (71.43%) |
| | With others | 25 (17.86%) | | With others | 20 (80%) | |
| Did not go anywhere | 4 (8.89%) | | 6 (17.14%) | | | |

The above table-5 shows that fourteen women, or 40% of women in group 1, go alone to the local market, whereas only six women, or 23% of women in group 2, go to the local market. On the other hand, 21 women, or 60% of women in group 1, go to the local market with others, whereas 20 women, or 76.92% of women in group 2, go to the local market with others.

Overall, 77.78% of women in the MC Programme of BRAC go to the local market for different reasons, and 74.29% of women in group 2 go to the same place.

The above table shows that 31.82% of women in group 1 go alone to the NGO's office, whereas only a quarter of women in group 2 do. This results in a significant difference between the two groups of rural women.

Therefore, 30 (68.18%) women of group 1 go to the NGO's office with other people like husbands, relatives, neighbours, and other women. In group 2, only two women go to the NGO's office with other people. Overall, 97.78% of women in group 1 go to the NGO's office; on the other hand, only 5.71% of women who are not involved in any MC Programme go to the NGO's office. There is a significant difference between the two groups of women. In group 1, 6 (16.67%) women go to the health centre alone, and 5 (25%) women in group 2 go to the same place alone. About 30 women, i.e. 83.33% of women in group 1, go to the health centre, whereas only 15 women, i.e. 75% of women in group 2, go to the same place as others.

Almost all women go to their natal home, but some are often restricted from going to it. Table 5 shows that 16 women of group 1 go to their natal home alone, whereas only five women of group 2 go to their natal home alone. On the other side, 25 women, i.e. 17.86% of women of group-1, go to their natal home with someone, and 20 women, i.e. 80% of group-2, go to their natal home with others. Overall, 91.11% of women in Group 1 go to their natal home, and 71.43% in Group 2 go there. Moreover, 8.89% of women in group 1 did not go anywhere, whereas 17.14% of women in group 2 did not go anywhere ever. So, there is a significant disparity between the group of beneficiaries of the MC programme and the non-beneficiary group. It is evident from the above table that, in the case of visiting every place except the local market and natal home, the proportion of women from the MC programme of BRAC member households is significantly higher than that of their counterparts in group 2.

6. Domestic violence

Nowadays, domestic violence has become an inseparable issue in our country. Women of almost every family have become victims of domestic violence, especially in rural areas. Domestic violence is one of the impediments to women's

empowerment. Different types of domestic violence like physical abuse, mental torture, money/land/jewellery taken against will, multiple marriages of their husbands, preventing from going to natal home and doing work outside households have to tolerate the rural women. Empowerment makes women raise their voices against domestic violence. So, domestic violence is considered an indicator of empowerment. To measure the participation of women against domestic violence, we used three categories in the following table.

*Table 6: Domestic violence against women.
(Number of respondents & Percentages)*

| Victims of domestic violence | Group-1 | Group-2 |
|------------------------------|--------------|--------------|
| Yes | 18 (40%) | 15 (42.86%) |
| No | 11 (24.44%) | 7 (20%) |
| No response | 16 (35.56%) | 13 (37.14%) |
| Total | N= 45 (100%) | N= 35 (100%) |

The above table shows that 18 women of Group 1 have become victims of domestic violence, whereas 15 women of Group 2 have become victims of domestic violence. Drawing a percentage of this, we can see that 40% of women in group 1 and 42.68% of women in group 2 have become victims of domestic violence. There are no significant changes between the two groups of women. 11 women in group 1 have no domestic violence, and in group 2, only seven women have no domestic violence. It shows that 24.44% of women in Group 1 and 20% of women in Group 2 have no domestic violence.

Out of 45 women in group 1, 16 women had no response about domestic violence, and out of 35 women in group 2 did not respond about this issue. In percentage, 35.56% of women in group 1 and 37.14% of women in group 2 have no response about domestic violence. Although there are no significant differences between the two groups, the percentages of Group 1 are higher than those of Group 2.

7. Gender awareness

Women's awareness of gender issues refers to their empowerment. So, it is one of the most significant determinants of women's empowerment. It helps women understand their equal rights in the family and society. In this study, we have selected women who are aware of gender issues and those who are not.

*Table 7: Gender awareness of women.
(Number of respondents & Percentages)*

| Gender awareness | Group-1 | Group-2 |
|------------------|-------------|--------------|
| Have awareness | 27 (60%) | 8 (22.86%) |
| No awareness | 18 (40%) | 27 (77.14%) |
| Total | N=45 (100%) | N= 35 (100%) |

The above table shows that 27 women of Group 1 are aware of gender issues, whereas only eight women of Group 2 are. Thus, 60% of women in Group 1 and only 22.86% of women in Group 2 are aware of gender issues.

The table also indicates that 18 out of 45 women in Group 1 and 27 out of 35 in Group 2 are unaware of gender discrimination. That is, 40% of women in Group 1 are unaware, while 77.14% in Group 2 are unaware. So, we can see a significant difference between the groups.

8. Protest against injustice

Women's participation in protests against injustice is another crucial determinant of empowerment. Empowerment increases awareness of all injustices. It determines women's ability to express their opinions against all injustices toward women. Here, we have selected some types of women's protection against injustice and divided them into four categories. They demand justice in the court, to the local chairman, to relatives, and compromise-minded people.

*Table 8: Participation in protest against injustice to women
(Number of respondents & Percentages)*

| Type of protest | Group-1 | Group-2 |
|---------------------------------------|-------------|-------------|
| Demand justice in court | 10 (22.22%) | 6 (17.14%) |
| Demand justice for the local chairman | 21 (46.67%) | 15 (42.86%) |
| Demand justice to relatives | 13 (28.89%) | 10 (28.57%) |
| Compromising | 32 (71.11%) | 26 (74.29%) |

Table 8 shows that ten women of group 1 demand justice in the court, whereas only six women of group 2 demand justice. Twenty-one women of Group 1 go to the chairman for justice, whereas 15 of Group 2 go to the chairman for justice. In Group 1, 13 women demand justice for their relatives; in Group 2, 10 women demand justice for their relatives. Furthermore, 32 women are compromising-minded of group-1, whereas 26 women of group-2 are compromising.

Now, calculating the percentages of these results, we can see that the large number of women of both groups, i.e. 71.11% of group 1 and 74.29% of group 2, are compromising. In group 1, 22.22% of women demand justice in court, whereas 17.14% of women in group 2 demand justice in the court. 46.67% of women in Group 1 and 42.86% in Group 2 demand justice from the local chairman. On the other hand, 28.89% of women in Group 1 and 28.57% of women in Group 2 demand justice for their relatives.

9. Political and Legal knowledge

The political and legal knowledge of women is considered an indicator of empowerment. It increases women's consciousness and influences them to empower themselves. In this study, I have used six different indicators of political and legal knowledge.

*Table 9: Women's political and legal awareness.
(Number of respondents & Percentages)*

| Knowledge | Group-1 | Group-2 |
|---|-------------|-------------|
| Knows the name of the Prime Minister | 38 (84.44%) | 28 (80%) |
| Knows the name of the local Chairman | 32 (71.11%) | 23 (65.71%) |
| Takes part in vote during election | 40 (88.89%) | 31 (88.57%) |
| Becomes influenced for casting vote by Husband/ others | 32 (71.11%) | 29 (82.86%) |
| Knows the legal age of marriage | 33 (73.33%) | 20 (57.14%) |
| Legal knowledge of divorce | 19 (42.22%) | 13 (37.14) |

The above table indicates that 84.44% of women of group-1 and 80% of women of group-2 have knowledge of the Prime Minister's name, 71.11% women of group-1 and 65.71% of women of group-2 have knowledge of the Local chairman's name. 88.89% of women in Group 1 and 88.57% of women in Group 2 participate in voting during the election. 71.11% of women in Group 1 and 82.86% in Group 2 are influenced by their husbands and other family members. 73.33% of women of group 1 and 57.14% of women of group 2 know the legal age of marriage, 42.92% of women of group 1 and 37.14% of women of group 2 know about divorce.

10. Education and Health awareness

Education is the most important indicator of women's empowerment. It helps women understand duties and responsibilities and increases their self-confidence

to empower themselves. Besides, health consciousness is considered an important indicator of women's empowerment. Here, we have compared the education and health awareness within the two groups using five awareness indicators which help empower women. I have used two educational indicators and three health indicators.

*Table 10: Women's Awareness in Education & Health.
(Number of respondents & Percentages)*

| Awareness indicators | Group-1 | Group-2 |
|---|-------------|-------------|
| Sends children to the school | 43 (95.56%) | 22 (62.86%) |
| Have a desire for higher education for children | 30 (66.67%) | 15 (42.86%) |
| Uses family planning | 35 (77.78%) | 18 (51.43%) |
| Knows how to prepare oral saline | 30 (66.67%) | 11 (31.43%) |
| Have sanitary latrine | 25 (55.56%) | 13 (37.14%) |

From the above table, we can see that, out of 45 women in group 1, 43 send their children to school, whereas out of 35 women in group 2, 22 send their children how to school. That is, 95.56% of women in Group 1 and only 62.86% of women in Group 2 send their children to school. In group 1 out of 45 women, 30 women desire higher education for their children, whereas 15 women in group 2 desire higher education for their children. That is, 66.67% of women in Group 1 and only 42.86% of women in Group 2 have the desire for higher education for their children.

On the other hand, 77.78% of women in group 1 use family planning, whereas only 51.43% of women in group 2 do. 66.67% of women in Group 1 know how to prepare oral saline, whereas only 31.43% of women in Group 2 do. In group 1, 55.56% of women have sanitary latrines, whereas in group 2, only 37.14% have sanitary latrines.

Finally, it can be said that in all categories, group 1 has higher awareness than group 2, which results in more empowerment of women.

Discussion

From the above findings in the study, it is pretty clear that BRAC has brought about substantial changes in the lives of its programme participants in terms of facilitating their material, perceptual and relational/power pathways to empowerment, both at the individual and family levels. Women previously not involved in income-earning activities have begun participating due to their involvement with BRAC. The MC programme of BRAC provides credit, training, and other support to rural

women so that they may become involved in different types of IGAs and bring about meaningful changes in their lives.

Through the MC programme of BRAC, some women in group 1 became involved in IGAs for the first time. In contrast, others were able to expand their traditional activities, which included poultry and livestock rearing, stitching, and fishing. Many women also became involved in non-traditional activities such as shopkeeping, small trading, and cocoon rearing. Some women were found to be engaged in these non-traditional activities alongside their existing traditional ones. Women continuing their pre-existing activities stated that after receiving assistance from BRAC, they could undertake these activities on a broader scale and more efficiently. Findings also show that women engaged in small trading before joining BRAC could not run their businesses smoothly due to a lack of capital. Sometimes, they had to take loans from money lenders at very high-interest rates. As such, they could not earn desirable profits and often incurred losses. After receiving BRAC loans, they had adequate capital to run their business and earn more profits.

From the point of view of empowerment, it is not enough if women are provided with opportunities for income generation but cannot retain control over how that income will be spent. When women were involved in IGAs of BRAC, they could retain some control over such income, especially since these were activities in which they did not require assistance from their male counterparts. More often, male counterparts tend to appropriate portions of women's income. Women might willingly hand over their income to them, thinking that men were better equipped to handle monetary transactions. Nevertheless, their husbands often consulted them about how to spend the income accrued from their IGAs. From the household survey, it is clear that women (group 1) involved in the MC programme of BRAC have more income than those (group 2) not involved in the MC programme.

Asset and resource ownership helps women's empowerment as it gives them the power to make decisions about using and managing those specific assets and resources. In Bangladesh, men traditionally exercise management and use rights over various assets, even if their female counterparts legally own these. This study defines control over assets as the ability to sell assets without the permission of husbands or other male family members. Regarding non-productive assets, the study found that women's ownership over jewellery and household utensils had increased over time. The survey findings on women's control over assets are quite encouraging as they indicate that such control over assets, both productive and non-productive, increases significantly over time. They mention that the ownership of women's resources in Group 1 is higher than that of the women in Group 2. In terms of control, only a few members had the confidence to say they could sell

these cows. They could spend money from selling milk but could not sell the cow itself without their husbands' concurrence. Poultry rearing and goat sharecropping are traditionally female domains in our country, and as such, women, generally, can control the sale of both poultry and goats. Traditionally, rural Bangladeshi women are conditioned to consider family interests as their well-being interests. Involvement in BRAC brings about wide-scale changes in the lives of such women. They can enjoy an improved status within the household due to their monetary contribution to household expenditure. Outside the household, they gain exposure to new ideas and knowledge by attending different VO meetings and participating in awareness-building and legal education training sessions. These changes will assist them in acquiring clear perceptions of their well-being.

Regarding personal expenses, women reported that since they had an independent source of income, they no longer needed to rely solely on their husbands whenever they wanted to purchase a new Sari (women's dress) or other personal items. However, there are significant differences between Group 1 and Group 2, i.e. group 1 has more purchasing power than Group 2. Women's monetary contributions to their households are significant during lean months⁵ or other crisis periods like illness, loss of crops, and so on, ensuring that family members do not have to go hungry and that the all-important instalment payments are made on time. Women have also reported an improvement in their relationships with their husbands. More often, men treat their wives better by handing over their BRAC loans to them.

By travelling to BRAC area offices and interacting with primarily male staff, handling money (many of them for the first time), and participating in various training sessions, women can break out of this typecast and acquire a degree of Self-confidence. Through its efforts at social mobilisation, BRAC tries to assist group members in overcoming erroneous practices regarding health, family planning, education, marriage and other vital matters. In different ways, members are applying all this newly acquired knowledge in their lives. When a woman becomes involved with BRAC, she must travel to, among other places, the BRAC local office and different places within the village to attend meetings. Because of what is perceived as a break of "purdah", the group member and her husband must face severe criticism from village elders, religious clerics, and the rural elite.

Countless women and their husbands have taken a stand against such actions and persevered against the odds. They have been exposed to new ideas, knowledge and experiences through their interactions with the world outside their homesteads. At the same time, through their newly acquired self-confidence and increased mobility, they can now ignore the negative comments that come their way. Some women stated that they still could not go anywhere at all without their

husbands' permission. Other members could go to the local market and health centre accompanied by their fellow members. Few members mentioned that they could freely move about on their own and even go to the market to make small personal purchases without asking their husbands for money.

Although women still may not be able to act against legal injustices, at least as a first step, they have been able to acquire knowledge of property rights, inheritance laws, the legal marriage age, polygamy, dowry, divorce, and other legal matters. In the case of remarriage by their husbands, however, many older members claimed that they were able to act. They have learned that it is illegal for their husbands to remarry without the first wife's consent. Women have reported that due to their BRAC involvement, they were no longer at the mercy of the village mohajans. Also, members of their communities no longer regarded them as credit risks. They can guide others in taking loans and feel they have acquired the self-confidence to take loans outside of BRAC. Men are initially reluctant to have their wives join BRAC as it involves interacting with strangers, but they soon learn to appreciate their wives' involvement in BRAC programmes. Some women do not traditionally engage in wage employment outside their homes; they usually hand over their BRAC loans to their male counterparts. Women have reported that because of their involvement with BRAC, their male counterparts treated them better, especially when they got a new loan. In other words, they were able to acquire some respect. Their husbands gave their opinions some value and importance. Members reported that although their husbands were the sole familial decision-makers, they could participate in the household decision-making.

Women are now practising family planning in order to keep their families small. Many have installed sanitary latrines and tube wells in their houses to ensure safe water and sanitation practices for their families, and they regularly get their children vaccinated. Women in Group 1 are more conscious of it than those in Group 2. For children's medical emergencies, they no longer rely solely on traditional healers but try to take them to health centres for proper treatment. Women of group 1 have also realised the importance of literacy and numeracy and make sure their children, particularly their daughters, attend school in group 2. They also want their daughters to lead better lives.

Traditionally, women can retain relatively greater control over savings than other assets, especially if these savings are ones that their male counterparts are unaware of. Women of Group 1 accumulated both cash and kind savings and used them during both anticipated and unanticipated crisis periods. All the members of Group 1 had cash savings in BRAC, and a few had cash savings in their houses as well.

Women try to keep their cash savings in clay banks, hidden underneath the floors of their homes or in hollow bamboo poles. Members stated that they mainly

accumulated cash savings from their income from IGA. Women also tried to accumulate some monetary savings from their husbands' income. The common form of accumulating cash savings was by reducing household consumption expenditures through collecting and selling mushti chaal (a handful of rice saved by rural women before cooking), eggs, milk and home-grown vegetables. In terms of savings in kind, all members said they saved mushti chaal and reared poultry and livestock, which they considered assurance for crisis periods and other emergencies.

Finally, we conclude that by participating in BRAC's micro-credit programme, most of the respondent of this study have developed their social and economic status and empowered themselves. However, some of these women could not develop themselves as they desired. Some of the respondents used their loans in the non-productive sectors as spending loans to buy TV, mobile, food, clothes, and building rooms. Those who used their loans in the productive sector and maintained BRAC's rules and regulations have developed. Some women are involved in BRAC's other development programmes to repay their loan instalments.

Most respondents are involved in the MC programme to gain better solvency for their families and make them economically independent. They can now go outside and make a community and have health awareness, too. Most of them are conscious of gender discrimination, domestic violence and injustice against women, but in practice, they are indifferent and compromising. They have political and legal awareness, but no significant changes have taken place in their lives. Moreover, educational awareness allows them to express their opinions adequately and makes them confident. So, in general, the MC programme provides significant development for rural women and helps them gain empowerment.

Conclusion

Based on empirical results and discussion, the overall conclusion of this study is that the level of women's empowerment is satisfactory at the household level. It also highlights that formal and non-formal education, exposure to information media and spatial mobility are the most influential factors that enhance women's empowerment. In contrast, the traditional beliefs, attitudes and practices are deeply entrenched in women's lives that hinder their empowerment. Taking women's access to credit as a starting point, we observed several positive changes on a material level, such as business expansion, higher income and increased expenditure on immediate and strategic needs. These changes translated into an expansion of opportunities of choice in the economic sphere and enhanced client agency.

However, economic empowerment cannot be understood solely regarding material change. The ability to imagine the world differently and to change structures

that determine opportunities for choice and agency must also be considered.

Due to women's involvement in BRAC, they have begun to acquire positive self-perceptions of their interests. These self-perceptions will allow them to assert themselves and demand their rights in their struggle towards socio-economic empowerment. It is also apparent that many men have begun to appreciate the benefits of having their wives involved in BRAC. Involvement with BRAC also appears to be a change agent in reducing women's economic dependence on their husbands and other male kin.

Women reported that they now have an independent source of income; they no longer need to rely solely on their husbands to purchase personal and household items. Women have also reported improved relationships with their husbands, primarily because they provide them with capital for investment purposes. As for women's mobility, BRAC involvement has had positive impacts to some extent. Travelling to BRAC local offices has given these women opportunities to communicate with the outside world and, at the same time, has helped them overcome their fear and timidity in dealing with strangers.

Overall, microcredit has a substantial impact on women's economic empowerment, and BRAC plays a meaningful role in providing empowerment to rural women in Bangladesh.

Recommendations

In light of this research, we forward the following recommendations for consideration:

1. Microfinance institutions should expand their support to poor rural women and strengthen their power.
2. The government and other developmental partners should collaborate for rural women, as they play an important role in empowering women socially and economically.
3. Interventions by governmental organisations (GOs), non-governmental organisations (NGOs), women's organisations (WOs), and other stakeholders (private initiatives, civil society, etc.) should be like legislative, planning, programme, or structural steps to provide greater opportunities for the sustainable development of women at all levels and to reduce discriminatory practices against women and all types of gender-based stereotypes.
4. The Ministry of Education, the Ministry of Women & Children's Affairs, and the Bangladesh Rural Advancement Committee (BRAC) should more effectively implement education programmes for rural women.

5. The Department of Agricultural Extension (DAE), with the collaboration of BRAC, should provide income generation training with financial support in the areas of home gardening, nursery development, cattle fattening, fish culture, craft production, and embroidery to advance skills and achieve economic self-reliance.
6. Gender education must be incorporated into the curricula from the primary school level.
7. Disseminating information through influential media is a prime need to create gender awareness among women and men. Major areas to combat gender disparity must include education, income, nutrition, health, dowry, early marriage, property, and divorce rights.
8. Launching vigorous conscientisation campaigns by organising rallies and public meetings, ensuring the participation of all rural people, could be an effective tool to create massive awareness about gender.
9. The electronic media (mainly radio and television) can play a more proactive role in raising awareness by broadcasting dramas, folk songs, puppet shows, and advertisements focusing exclusively on a positive image of women. Some other media, such as posters, newsletters, and booklets, could also be effective for literate people.
10. The government should establish a legal cell integrated within the family courts or separately at the village level to give free legal advice to women and girls.
11. Establishing women's self-help groups as vehicles for female empowerment is necessary in the rural area's donors, NGOs and WOs initiatives' would be fruitful to develop these groups in rural areas. It will provide rural women with a platform to come together to act as a pressure group while providing the members economic (e.g., credit) and social support (e.g., legal support and counselling).
12. Issues related to women's empowerment should be given priority in the interventions of village councils and religious groups at the local level. This can only be achieved if all concerned agencies function as a close network. Their initiatives would build the base for promoting positive family practices, social norms favourable to women, income generation and education, and encouraging gender equality in the community. Thus, the affluent section of the community can play a dominant role in improving women's status.
13. Incorporate programmatic elements such as training and leadership opportunities contributing to women's empowerment.

14. The Government should develop a legal framework and policy that protects women's rights in critical areas such as the inheritance and ownership of property and domestic violence.
15. The Government should consider women's needs when developing economic policies, infrastructure and other projects.
16. The Government should promote equal educational opportunities for women and men.
17. Review organisational policies to ensure gender sensitivity and gender equity.
18. Donors should conduct and support action research on best practices in empowering women.
19. Orientation and training should be provided on procedures for access, loan utilisation, interest payment, and instalments.
20. Improve targeting and evolve strategies for covering leftover poor women in existing villages through micro planning.

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Freshwater Resources and the Agricultural Sector

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Abstract

Freshwater is depleted very rapidly, which will adversely affect the world economy. Agriculture will be the sector most affected by future water shortages. Therefore, it is essential to model water utilisation and the agricultural industry. This paper examines the two relationships between water scarcity and agricultural growth. First is a neoclassical model where freshwater is taken as a factor of production in the agricultural sector. The second model is an Environmental Kuznets Curve model, where agrarian output takes freshwater depletion as an environmental degradation. Using EU member countries' data, it was found that water utilisation and agricultural production have a robust inverted U-shaped relationship. The significant proof was that water scarcity followed the EKC trend with agricultural output. For the econometric analysis, panel data regression with endogenous covariates was used.

Keywords: *Water resource · Environment · EKC · Agriculture · Neoclassical Growth model*

Introduction

Water is essential for human existence. We use water daily, and it is an intricate part of a functional economy. We know that the Earth is a blue planet, and about 75% is covered by water. This might make people think that water scarcity should not be a problem. However, of that 75% of Earth's water, only 1% is available for human consumption and production. Freshwater resources are finite; however, water demand is not. The stress on freshwater resources will increase significantly in the near future with the growing population, climate change, and urbanisation (Alcamo et al., 2007; Hoekstra, 2014). Over the last century, water

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use has increased more than double the rate of population increase. Water scarcity today already weakens economic prosperity in many countries. Accounting for population growth alone, 46% of the world population will live in countries with severe water scarcity by 2050 (World Bank, 2016). Climate change will further amplify this problem; renewable water resources will be affected by the projected temperature change, precipitation pattern, and other climate variables (Damania & Roson, 2017). Global water demand is projected to surge by 55% by 2050, making water the most extremely challenging resource on Earth (OECD, 2013). Freshwater resources are finite, but their demand is multiplying with population and economic growth.

The most considerable effect of water scarcity will be on agriculture. Agriculture is the most water-intensive sector. Intensified water constraints could mean a threat to food and nutrition security. Out of all global freshwater withdrawals, agriculture accounts for about 72% (UN-Water, 2021). 3.2 billion people live in arable areas with high water scarcity, of which 1.2 billion live in severe water-scarce agricultural regions. The effect on agriculture is relevant because, in developing countries, agriculture is the dominant part of the countries' gross domestic product (Aksoy & Ng, 2010). Studies show that because developing economies depend on agricultural production, future water shortages will stunt the economies' growth and cause wider global inequality (Aksoy & Ng, 2010). Also, due to globalisation and international trade, a shock to agricultural production will have worldwide consequences. Therefore, understanding future freshwater trends and agricultural growth worldwide is vital for policymaking. There is evidence that water affects agrarian growth. Auffhammer et al. (2006) and Fishman (2016) found that rainfall and temperature affect Kharif-rich production in India. There is also strong evidence of a positive correlation between accumulated rainfall and rice production in Thailand, the Philippines, and Indonesia (Sawano et al., 2008; Koide et al., 2013; Naylor et al., 2007).

There is very little research on the effect of water scarcity on the agricultural sector. This paper will try to answer this question in two different ways. The first way is to find the relationship between agricultural growth and freshwater water utilisation. The model should explain how water utilisation can be modelled into the agricultural output model. The second way is to find empirically if there is an EKC relationship between water utilisation and agricultural growth.

EKC studies showed a possible inverted U-shaped relationship between freshwater utilisation and agricultural growth (Katz, 2015). Water use will increase in the first stage of agrarian growth and decrease after a specific turning point. Studying this relationship can answer some questions about water resource management in agriculture. There can be two significant reasons for restricted

water utilisation; the first is that there can be an absolute lack of water. Secondly, as water becomes scarce, public institutions will restrict public water use. So, it can be hypothesised that freshwater use and agricultural output follow an EKC path. The reciprocal linkage between environmental performance and economic development is integral to economic research. Grossman and Krueger (1995) said, “Our lives are affected by the air we breathe, the water we drink, the beauty we observe in nature, and the diversity of species, “which means ecological quality is vital to the human race. Since the Industrial Revolution, there has been a heightened public concern for environmental degradation. For example, global warming is the by-product of the Industrial Revolution, using extensive fossil fuels to power economic growth (Uchiyama, 2016). In the 21st century, we are in an ecological overshoot; the demand for environmental resources is higher than the available supply worldwide (WWF, 2016). Deforestation, erosion, extinction, and renewable water shortages are all due to ecological overshoot.

Therefore, understanding the mechanism driving environmental degradation is necessary now more than ever. Recent research is trying to push the econometric relationship between GDP and various indicators of environmental quality. Much research postulated an inverted-U relationship between economic growth and ecological damages called the Environmental Kuznets Curve. Most EKC research is on air pollutants and water pollutants, but very few shed light on how the economy will behave when freshwater starts to exhaust. This paper looks into this problem and will check if there is an EKC relationship.

Water significantly impacts economic growth, and the lack of fresh water already constrains economic growth in China and India (Pacific Institute, 2007). Modelling the relationship between water utilisation and agricultural development requires us to define water as a government-provided non-excludable production input. Also, to model water scarcity, water utilisation will be subject to congestion. Using the approach of Barro (1990) and Barro and Sala-I-Martin (1992), a model for agricultural growth, including public good water, can be hypothesised. There are two fundamental ways water scarcity will affect the farm sector. First, when water starts to become scarce in the agricultural industry, the government will intervene to allocate water efficiently to the farms. The second factor is an absolute restriction on water use due to availability. So, in the model, there is a binding factor if the country’s agriculture sector has water constraints. Barbier (2004) used water usage and its impact on economic growth. However, his data set was limited, and the economist called for further analysis. Few empirical papers have provided evidence of a robust relationship between water usage and agricultural output.

Using data from 27 EU member countries, I have set up an econometric analysis to understand the relationship between water usage and the agricultural

sector. The results showed a robust relationship between the two types of water and agriculture models.

This paper is set as follows. The next section will review some literature on the theoretical and empirical studies of the Environmental Kuznets Curve. The first part of Chapter III will introduce a simple neoclassical growth model for agriculture using agricultural water stress as an input. The second part of this section will show the econometric framework to prove the model. Chapter IV will show the results of the econometric analysis, and this section will also consist of a regression that proves that water scarcity also follows the EKC. Chapter V will discuss some critical problems with the agricultural growth model and critique the EKC. Chapter VI consists of the conclusion and future research recommendations.

Literature Review of the Environmental Kuznets Curve

In the mid-1950s, economist Simon Kuznets hypothesised that income inequality should follow an inverted U-shaped trajectory with economic development. Grossman and Krueger, Shafik and Bandyopadhyaya, and Panayotou were the first researchers to find an inverted U-shaped connection between environmental evolvment and economic growth. Panayotou was the first to name the U-shaped relationship the Environmental Kuznets Curve (EKC). The Environmental Kuznets Curve is a hypothesised association between environmental degradation and economic growth. Ecological degradation accumulates with economic development at the initial stages, but pollution decreases with an increase beyond a turning point. It means that at the beginning of industrialisation, inequality will rise because of immobile workers and decline as more and more workers join the productive sectors (Kuznets, 1955).

There are a few possible reasons for the shape of the EKC. The first reason is the equity of income distribution. Simon Kuznets first hypothesised the relationship between economic growth and income distribution. Similarly, economic growth can make the average citizen better off. Economic development makes more of the population aware of the environment, preferring less environmentally harmful options. Torras and Boyce (1998) said pollution would be reduced if the power gap between agents who benefit from it and agents burdened by pollution decreases. Therefore, if income inequality decreases, so will environmental degradation. Empowering agents that bear the burden of environmental degradation will improve the environment. Empowering agents can be done through education and equitable income distribution (Bimonte, 2002). Bimonte (2002) uses data from countries in the last phase of economic development to estimate the EKC. He found that the shape and level of the EKC curve depend on the population's participation during the growth process. Education, information access, and income inequality

can shift the EKC curve. This is why countries with a similar level of growth can have widely different pollution levels. Magnani (2000) found a significant inverted U-shaped relationship between income inequality and expenditure on environmental protection research in OECD countries. Therefore, the descending slope of the EKC will appear if the economic growth does not increase income inequality. Cantore and Padilia (2010) found a robust correlation between income distribution and pollutant emissions. To find an EKC-shaped relationship, Coondoo and Dinda (2008) used European countries' data on inter-country income inequality and carbon dioxide emissions. However, due to the data structure and availability, it is impossible to significantly say that the citizen's perception of environmental degradation changes with a change in income distribution.

The second reason for the EKC pattern can be variations in consumer preferences due to changes in income. Andreoni and Levinson (1998) used a static partial equilibrium model of consumers' preference between maximising consumption and minimising investment for abating pollution. They found that investment will increase with income so that the EKC shape can arise. An increase in the average income of citizens can change the elasticity of demand for environmental quality. Lopez (1994) used a static general equilibrium model where output and welfare are attributes of the environment quality; he found that non-homothetic utility functions may cause the EKC. If the elasticity of demand for better environmental quality is more significant than unity, increased wealth or income will make consumers move to environmental options (Dinda, 2004). In Sweden, Kander and Lindmark (2004) estimated that after 1970, the population put a higher value on environmental quality and caused policy changes to prevent pollution. However, Martini and Tiezzi (2010) found that the income elasticity of willingness to pay for the quality environment in Italian households was less than or equal to unity. The consumer income–pollution relationship is complicated to analyse on a macroeconomic level because consumer preferences are based on microeconomic foundations (McConnell, 1997).

Technological progress or structural changes are another primary reason behind the inverted U-shaped relationship. Technological advancement includes developing environmentally favourable production technology, which releases fewer pollutants or requires fewer polluting inputs. The structural change consists of changing primary industries in the economy, transferring from polluting industries (manufacturing or mining industries) to less pollution-intensive industries (information or service-based industries). The economic scale effect is that more resources and energy consumption will increase environmental degradation through pollution or depletion when growth occurs. The scale effect causes the upward trend of the EKC curve when an economy shifts from primary to secondary

production. At this stage, the economy has the resources to invest in better modes of production or can change to tertiary industries. This shift is termed the composition and technique effect. The composition effect means environmental degradation will increase when an economy shifts from agrarian to manufacturing. However, production initially increases ecological degradation when the economy develops and moves from manufacturing to an information or service-based economy. However, it falls when the economy shifts to a more environmentally friendly industry (Panayotau, 2003). The technological effect occurs when the economy adopts better ecologically friendly technology through research and development (Neumayer, 1998). Technological or composition effects concentrate on production, not consumption so that it may depend on business-cycle fluctuations or market mechanisms (Bouvier, 2004; Smulders et al., 2010). When the composition and technique effect exceeds the scale effect, the economy will be at the turning point of the EKC and will start its downward-sloping path (Dinda, 2004). Jaeger (1998) specifies a general equilibrium model where the choice is between a clean or polluting production method; he concluded that when income level increases, abundant and polluting resources start to get scarce, so agents move to cleaner and more efficient technology over a period of time. John and Pecchenino (1994) used a dynamic overlapping generational model with environmental degradation as an attribute of utility; they found that at low-income levels, no environmental investment is optimal. However, as income increases, capital stock accumulation related to better environmental quality leads to EKC. Jones and Manuelli (1995) also used a dynamic overlapping generational model; pollution is a by-product of capital use and enters the utility function in the model. Producers have a choice between clean methods or pollution-releasing technology. Pollution taxes and standards are also specified in the model. Optimal taxes and standards policy will cause producers to choose environmentally friendly inputs, resulting in the EKC. Stokey (1998) proposed a dynamic infinite horizon model two-country growth model where pollution is an attribute of utility, and environmental degradation is a production waste product. He found a critical value in which the technological effect is the turning point of the inverted U-shaped relationship. Dinda et al. (2000) observed suspended particulate matter and sulphur dioxide levels across regions and time. They found that the pollution level can be attributed to changes in production technology and sectoral composition. Hattige et al. (2000) used industry water pollution data and industry share in total production as an explanatory variable. The relation follows an inverted U-shaped trajectory.

The institutional framework can also be a fundamental reason behind the EKC pattern. The primary theory behind the institutional framework is that as the economy grows, the government is keener and has the budget to impose

policies that prevent market failure due to pollution. However, whether such policy changes will decrease environmental degradation is unclear and depends mainly on social institutions and functional markets. Dutt (2009) found an EKC pattern in developed countries with more potent institutions. Bhattarai and Hammig (2001) researched tropical deforestation and found that institutional factors are much more significant in decreasing deforestation than other macroeconomic factors. The last reason economists found was the international trade and pollution haven hypothesis. International trade increases the economy's production capacity through comparative or absolute advantage. Higher production causes pollution. When environmental degradation rises primarily due to higher pollution, stricter anti-pollution legislation will be imposed. These regulations will shift them from now expensive domestic production due to legislation to importing from other countries with fewer regulations. This transition from manufacturing to importing is known as the pollution haven hypothesis because domestic pollution is declining. Suri and Chapman (1998) used a model with the proportion of imports and exports to GDP as another explanatory variable for income. They found strong evidence that trade shifts the EKC for carbon dioxide.

Much empirical research proves the existence of the EKC and the relationship between carbon dioxide emissions. Carson et al. (1997) used 1990 cross-sectional data in the US states and found a significant inverted U-shaped relationship between carbon emission and economic growth. Roberts and Grimes (1997) used data from low-medium-high-income countries and other social-political factors as parameters. They found that wealthy countries followed the EKC trend, but low- and medium-income countries did not show any inverted U-relationship with GDP and carbon dioxide emissions. Galeotti et al. (2006) find evidence of EKC for OECD countries but not for non-OECD countries. Coondoo and Dinda (2008) used panel data from 1960-2000 from 88 countries and inter-country income inequality as an explanatory variable. They found that only European countries follow the EKC trajectory of income and emissions.

Villanueva (2012) examined the impact of structural and government institutional quality on the environment and supported the EKC hypothesis. Lee et al. (2009) incorporated the pollution haven hypothesis in their econometric model. They used panel data from 1960- 2000 from 88 countries. The panel found an N-shaped relationship between carbon dioxide emissions and per capita income and an inverted U-shaped relationship between middle-income, American, and European countries. Dutt (2009) took 1960- 2002 panel data from 124 countries. He used other parameters like the political institution, socio-economic conditions and education. From 1960- to 1980, data showed a positive relationship between economic growth and emissions, but from 1984 to 2002, the association was

an inverted U-shaped. Taguchi (2012) found that sulphur emissions follow the expected EKC shape, but carbon dioxide emissions correlate positively with economic growth. Perman and Stern (2003) used cointegration and unit root tests and found that sulphur emissions follow an inverted U-shaped relationship in the long run. Osabuhien et al. (2013) found that social and institutional quality, international trade, and economic growth can jointly provide evidence for EKC in the long run in Africa.

Some empirical evidence found inconclusive relationships or a positive relationship between environmental degradation. Azomahou and Van Phu (2001) researched panel data on 100 countries from 1960- 1996 and found a positive relationship between economic growth and carbon dioxide emissions. De Bruyn et al. (1998) used data from the Netherlands, West Germany, the UK and the USA and used other parameters like population, technology, and structural changes. The time series regression results gave a robust positive relationship between income per capita and emissions. Egli (2002) used time-series data from 1966- 1998 in Germany and found an inconclusive relationship between income and carbon dioxide emissions. Halicioglu (2009) used time-series data from Turkey and used energy consumption and foreign trade as the other explanatory; he found a robust positive relationship. Few pieces of research were devoted to fixing the econometric issues. Roberts and Grimes (1997), Moomaw and Unrug (1997), Cole et al. (1997), and List and Gallet (1999) found that changing the data structure changes the results of EKC research. For example, if cross-sectional data is substituted with time-series data and regional data with country-specific data, the turning point of the EKC changes. In some cases, there is no inverted U-shaped relationship.

There is extensive literature on pollution and economic growth, mainly the relationship between carbon dioxide emissions and economic development. There are also a few pieces of research on water pollution and economic growth. Most studies based on water pollution and economic growth showed an ambiguous inverted U-relationship. Farzin and Grogan (2012) used data from California State to find the relationship between income and water pollution. They also included main socio-economic factors, like agricultural intensity, land use, educational attainment, ethnic composition, and population density. Phosphorous and suspended solids are robust determinants of water quality. However, they found no proof of the EKC relationship. Shen and Hashimoto (2004) found an EKC relationship between most water pollutants in China. However, the relationship is N-shaped for dust fall and industrial waste stock. Barua and Hubacek (2008) performed GLS and GMM estimation on 20 (1981-2001) years of panel data from India. They did not find substantial evidence of an inverted U-shaped relationship between per capita income and water quality. They found that reducing water

pollution during economic growth is short-lived; the pollution rises further with economic growth. Paudel et al. (2005) performed parametric and semiparametric regression models on watershed-level data of the Louisiana state. They found an N-shaped relationship between pollution (nitrogen, phosphorous and dissolved oxygen concentrations) and GDP per capita. Lee et al. (2009) performed a GMM analysis to find the EKC relationship between real income and biological oxygen demand emissions. They have an inverted U-shaped relationship in America and Europe, but no evidence of EKC exists in Asia, Africa, or Oceania. Although most of the research was between water pollution and economic growth, there is little research on the relationship between renewable water resources and agriculture. Section IV will use the ideas and econometric methods of the EKC literature to find if agricultural growth and renewable water resources follow the inverted U-shaped relationship.

Methodology for Modelling Agricultural Growth and Water Utilisation

I. Neoclassical Model of Renewable water use and Agricultural output

Using concepts from Barro (1990) and Barro and Salam-I-Martin (1992), we can set up a neoclassical growth model to model an economy’s renewable water use and agricultural growth.

Given the constraints, the model will be a social planner’s problem maximising the utility of a unit-mass continuum of identical utility-maximising households. The social planner will find an optimal path by choosing the present and future allocation of agricultural consumption and using freshwater resources to maximise social welfare. The identical preferences over an infinite time horizon are $U = \int_{t=0}^{\infty} \beta^t u (c_t)$

β is the time constant discount factor, with $\beta \in (0, 1)$

$u (c_t)$ for this model is assumed to be Constant Relative Risk Aversion, so

$$u (c_t) = \frac{c_t^{1-\theta}}{1-\theta}$$

θ is the parameter that measures the degree of relative risk aversion implicit in the utility function. If we find the marginal rate of substitution between time period t and $t+1$

$$\frac{c_t}{c_{t+1}} = \left(\frac{u'(c_t)}{u'(c_{t+1})} \right)^{1/\theta}$$

For the CRRA utility function, the elasticity of substitution is constant, $1/\theta$. The CRRA’s other properties are $u'(c_t) > 0$ and $u''(c_t) < 0$. Which means the utility function is concave. Also, to guarantee stable agricultural growth in the

neoclassical growth model, the utility function needs to satisfy the Inada conditions, and CRRA does satisfy it

$$\lim_{c_t \rightarrow 0^+} u'(c_t) = \infty \quad \text{and} \quad \lim_{c_t \rightarrow \infty} u'(c_t) = 0$$

Water for agriculture and irrigation is modelled as a nonexcludable public good subject to overcrowding. Producer y_i can produce

$$y_i = Akf\left(\frac{w}{Y}\right)$$

Where $A > 0$ is the parameter that reflects agricultural technology (this includes irrigation technology, fertilisers, land efficiency, etc.). k to simplify the model includes both human and physical capital stock used in agricultural output. Y is the total agricultural production, and as all the producers are identical, $Y = \sum_{i=1}^N y_i$ (N is the total number of producers). f is the production function and should have these properties $f' > 0$ and $f'' < 0$, so the production function is concave. Also, the production function should satisfy the Inada conditions for the stability of the model

$$\lim_{c_t \rightarrow 0^+} f' = \infty \quad \text{and} \quad \lim_{c_t \rightarrow \infty} f' = 0$$

In the model, the production function depends on the ratio $\frac{w}{Y}$ because agricultural water utilisation must increase compared to agricultural output Y to increase individual agricultural output. Similarly, a relatively higher increase in total agricultural output per capita than total water utilisation will reduce production. This production function captures the non-excludable and overcrowding aspect of water utilisation among producers. To supply water, there are costs to build pipes, dams, pumping stations, etc. So, we can model the water utilisation of agriculture as a share of total agricultural output. $0 < \alpha < 1$ can be the share of agricultural output devoted to water supply. So renewable water utilisation is equal to $w = \alpha Y$. $\phi = \frac{w}{W}$ is the rate of water utilisation relative to total renewable water resources. So, $w = \alpha(\phi)Y$ and we can impose the constraint $w = \alpha(\phi)Y \leq W$.

$$\alpha(\phi)Y < W \text{ if } 0 \leq \phi < 1$$

$$\alpha(\phi)Y = W \text{ if } \phi = 1$$

$\alpha'(\phi) > 0$ and $\alpha''(\phi) < 0$, the proportion of agricultural output used to fund the water supply is assumed to be an increasing function concerning the $\frac{w}{W}$. α is an increasing function of ϕ because it is assumed that as water scarcity increases, so will the cost of appropriation of freshwater. Also, when aggregate agriculture rises, so will water utilisation; $\phi \rightarrow 1$, and α will reach its upper bound γ .

Last, we need the dynamics of k

$$\Delta k_t = y_t - c_t - w - (n + \tau)k_t$$

Δk_t is the change in capital stock per capita. n and τ are the population growth and depreciation of capital, respectively. $\Delta k_t = 0$ when consumption equals the difference between the agricultural output and investments.

The Lagrangian can be set up to find the values of c and ϕ that maximise the utility function given the water utilisation and the consumer's budget constraints.

$$\mathcal{L} = \int_{t=0}^{\infty} \frac{c_t^{1-\theta}}{1-\theta} - \lambda_t [y_t - c_t - w - (n + \tau)k_t] - \mu_t [W - w]$$

$$\Rightarrow \mathcal{L} = \int_{t=0}^{\infty} \frac{c_t^{1-\theta}}{1-\theta} - \lambda_t \left[Akf\left(\frac{W}{Y}\right) - c_t - w - (n + \tau)k_t \right] - \mu_t [W - w]$$

f can be written as a function of $\alpha(\phi)$ so the Lagrangian can be written as

$$\mathcal{L} = \int_{t=0}^{\infty} \frac{c_t^{1-\theta}}{1-\theta} - \lambda_t [Akf(\alpha(\phi)) - c_t - \alpha(\phi) Akf(\alpha(\phi)) - (n + \tau)k_t] - \mu_t [-W + \alpha(\phi) Akf(\alpha(\phi))]$$

So, the first-order conditions are

1: $c_t^{-\theta} = \lambda_t$. This is the standard condition that the marginal utility of consumption is equal to the Lagrange multiplier

2: $\lambda_t [(1 - \alpha) Akf' \alpha'] - \lambda_t Akf \alpha' = \mu_t [\alpha' Akf + \alpha Akf' \alpha']$ this equation determines the optimal water utilisation decision.

$\mu_t \geq 0$ or $W - \alpha(\phi) Akf(\alpha(\phi)) \geq 0$ and $\mu_t [W - \alpha(\phi) Akf(\alpha(\phi))] = 0$ this is the complementary slackness conditions (Kuhn-Tucker condition) imposed by the water scarcity constraint.

3:

$$\beta \lambda_{t+1} = \lambda_t [(1 - \alpha) Af - (n + \tau)] + \mu_t \alpha Af$$

$$\Rightarrow \beta c_{t+1}^{-\theta} = c_t^{-\theta} [(1 - \alpha) Af - (n + \tau)] + \mu_t \alpha Af$$

This equation shows the consumption trajectory given the agricultural capital stock.

4: $\lim_{t \rightarrow \infty} \beta \lambda_t k_t = 0$ is the transversality condition that stops over-saving.

From these equations above, we can find the growth rate of consumption

$$g = \frac{\Delta c}{c} = \frac{1}{\beta \theta} [(1 - \alpha) Af - (n + \tau)] - \mu \frac{\alpha Af}{c^{-\theta}}$$

The growth rate depends on whether the water scarcity constraint is binding.

First, let us see what happens when the water scarcity is not binding, so $\mu = 0$.

$$g = \frac{1}{\beta\theta} [(1 - \alpha)Af - (n + \tau)]$$

We can see that water scarcity is not affecting growth. If water scarcity constraint is not binding, the equation 2 becomes $[(1 - \alpha)Akf' \alpha'] = \lambda_t Akf \alpha'$. There is no water scarcity, but water resources still affect growth through $\alpha(\phi)$. Water utilisation is negatively related to growth to α , which means more agricultural output is used to supply the water. Growth is positively related to the contribution of water utilisation to marginal productivity. The optimising rate of water utilisation relative to total water resources is θ^* . This should solve the equation 2; $[(1 - \alpha(\theta^*))f' \alpha(\theta^*)'] = f \alpha(\theta^*)'$. When $\theta < \theta^*$, then $\partial g / \partial \theta > 0$, agricultural growth will increase with the increase in water utilisation. When $\theta > \theta^*$, then $\partial g / \partial \theta < 0$, agricultural growth will diminish with water utilisation. From here, we can see an inverted U-shaped relationship between renewable water use and agricultural growth, even when there is no water scarcity problem.

Now, when the water scarcity constraint is binding, $\mu_t > 0$. Complementary slackness requires $w = W$. So, the share of agricultural output appropriated for supply will reach its upper bound $\alpha(1) = \gamma$. The growth rate for water constraint production

$$g = \frac{1}{\beta\theta} [(1 - \gamma)Af(\gamma) - (n + \tau) - \mu \frac{\gamma Af(\gamma)}{\lambda}]$$

Growth is negatively affected by the share of agricultural output used to supply water and negatively affected by the water scarcity constraint. Growth is positively related to water use in productivity. Equation 2 becomes $\mu = \lambda [f' \gamma f \gamma + \gamma f' \gamma - 1]$, and by the complementary slackness condition $\lambda \left[\frac{f'(\gamma)}{f(\gamma) + \gamma f'(\gamma)} - 1 \right] > 1$. So, the growth equation for

$$g = \frac{1}{\beta\theta} [(1 - \gamma)Af(\gamma) - (n + \tau) - \gamma Af(\gamma) \left[\frac{f'(\gamma)}{f(\gamma) + \gamma f'(\gamma)} - 1 \right]]$$

So, if $Af(\gamma) - (n + \tau) > Af(\gamma) \left[\frac{f'(\gamma)}{f(\gamma) + \gamma f'(\gamma)} \right]$, $g > 0$ and vice versa. During the water constraint situation, it is optimal to use the maximum rate of appropriation γ . Growth will only occur if the net marginal productivity of resources exceeds the negative effects of water scarcity. When there is a water constraint, we can see that water resources and agricultural growth can follow an inverted U-shaped relationship. Water is always important, so the marginal benefit of using water is always greater than the marginal cost of extracting water. Therefore, allocating the maximum amount of output to water extraction is optimal. However, whether

this will lead to agricultural growth depends on the net marginal productivity of resources.

II. Econometric model

From the theoretical model above, we can assume that agricultural growth and freshwater relationship follows an inverted U-shaped relationship. We have to use data to back up the economic model theorised above. When water utilisation increases in the beginning, so will agricultural growth, then it will reach its maximum and decrease if water utilisation increases. From the theoretical framework above, we can reduce it to the postulated inverted-U quadratic functional form relationship between water utilisation and agricultural growth. Other exogenous shift variables can be incorporated, such as population, agricultural raw materials import, country-specific variables, etc.

$$Y_t = f(W_t, X_t)$$

Where W_t is the water utilisation rate of the agricultural economy (water withdrawal used in agriculture divided by the net water resources in the country). Y_t is the total agricultural output of the economy. X_t comprises the other exogenous factors affecting agrarian output. There can be two functional forms; one is the inverted relationship on levels, and the other one could be a quadratic relationship in logarithms. These equations are

$$Y_{it} = \beta_1 + \alpha_i + \beta_2 W_{it} + \beta_3 W_{it}^2 + X_{it} + u_{it} \text{ relationship on levels}$$

$$\ln Y_{it} = \beta_1 + \alpha_i + \beta_2 \ln W_{it} + \beta_3 \ln (W_{it})^2 + X_{it} + u_{it} \text{ relationship in logarithms}$$

W_{it} denotes the water utilisation indicator for a country i in the year t . Y_{it} is the agricultural output indicator for a country i in the year t .

For this paper, I have used data from the EU member countries. There are 27 member countries in the EU. The data was taken from 1972 to 2017, with five-year gaps. The five-year gap is taken because the data available on water withdrawal are five-year averages. From AQUASTAT (2021), I found five-year averages of water stress data; this is the total water withdrawal as a proportion of available freshwater resources. I also extracted the percentage of water withdrawal used in agriculture. Using water stress and portion of water withdrawal used in agriculture data, I calculated the water stress for agriculture; this is W_{it} in our econometric analysis. Y_{it} is the agricultural growth data of the countries the World Bank (2021) found. Y_{it} using total agriculture output will also be used in the analysis. I am using population, use of fertilizer in agriculture, the workforce in agriculture, etc, as shifter explanatory variables. The summary statistics of these data can be found in the table below.

Descriptive Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|------------------|-----|----------|-----------|---------|----------|
| agriuse | 189 | 6.645 | 9.366 | .007 | 47.962 |
| agri w use | 189 | 24.616 | 27.624 | .208 | 98.283 |
| agri GDP | 176 | 3.627 | 3.165 | .245 | 20.477 |
| agri growth | 170 | 1.16 | 10.688 | -27.069 | 47.821 |
| agri raw imports | 219 | 2.59 | 1.648 | .251 | 9.053 |
| population | 270 | 15659454 | 20533390 | 302450 | 82657002 |
| irrigated | 48 | 8.459 | 9.806 | .034 | 33.981 |
| water stress | 210 | 25.089 | 22.898 | 1.067 | 109.663 |
| employ agri | 179 | 591.276 | 814.545 | 1.807 | 4577.547 |
| fertiliser | 234 | 216.826 | 184.475 | 30.75 | 1349.008 |

agriuse = $\frac{\text{Argri_w_use}}{100} \times \text{water_stress}$ = proportion of water used in agriculture and freshwater resources

agriuse = agriuse \times agriuse

agri_w_use = proportion of withdrawal used in agriculture

agri_growth = agriculture, fishing, forestry value-added annual growth

agri_growth2 = agri_growth \times agri_growth

agri_GDP = agriculture, fishing, forestry value-added current US\$ in billions

agri_raw_imports = agricultural raw materials import percentage of merchandise imports

population = total population

irrigated = agriculture irrigated land percentage of total agricultural land

water_stress = freshwater withdrawal as a proportion of available freshwater resources

employ_agri = Total workforce employed in the agricultural sector in thousands

fertiliser = kilograms of fertiliser consumption per hectare of arable land.

α_i is the time-invariant country-specific error term that can be estimated. α_i is uncorrelated with the idiosyncratic shock u_{it} .

The hypothesised relationship is the relationship between $W_{it}/\ln W_{it}$ with Y_{it}/Y_{it} ; if there is an inverted U-shaped relationship that is then regression results should be $\beta_2 > 0$ and $\beta_3 < 0$. The water utilisation level where the turning point occurs is $-\frac{\beta_2}{2\beta_3}$. If the regression is in logarithms, the turning point is $\exp\left(-\frac{\beta_2}{2\beta_3}\right)$.

Results

I. Econometric Analysis of the Water Utilisation – Agricultural Growth Model

Agricultural production consists of crop production and animal production. First, I wanted to see if the inverted U-shaped relationship holds for a few water-intensive agricultural products: cereal, wheat, barley, cattle meat, and sheep meat. The regression results of the crops and meat output on water utilisation and water utilisation squared.

| | (1) | (2) | (3) | (4) | (5) |
|--------------|----------------------------|---------------------------|-----------------------------|---------------------------|---------------------------|
| | cereal_pro | wheat_pro | barley_pro | cattle_meat | sheep_meat |
| agriuse | -14065.916 (63474.599) | -7499.48 (32677.13) | 10788.463 (19043.009) | 47.286 (1449.338) | -92.608 (241.514) |
| agriuse2 | 1670.566 (1797.755) | 1163.18 (1128.859) | -176.517 (497.258) | -68.323 (64.31) | -1.771 (8.303) |
| _cons | 10527171*** (248755.74) | 4483542*** (145789.74) | 2289016.2*** (66191.658) | 376202.6*** (5927.939) | 35157.328*** (877.059) |
| Observations | 163 | 160 | 160 | 160 | 160 |
| R-squared | .019 | .025 | .005 | .038 | .009 |

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

For the regressions above, Schaffer's (2010) Stata code `xtivreg2` was used to determine whether the `agriuse` is endogenous. If it was, the endogenous instrumental variable was supposed to be used. The endogeneity test showed that this regression `agriuse` is unrelated to the idiosyncratic shock. Another test was done to check if the error term is homoscedastic or heteroscedastic across country groups. The null hypothesis is that $var(u_i) = var(u)$, where i is the country group. Modified Wald test for group wise heteroskedasticity was done, and it showed that there is groupwise heteroskedasticity. The reason for clustering is that each country in the EU can have different background characteristics due to each country's agricultural policies. Due to heteroskedasticity, cluster robust standard errors were used for inference. The regression table above shows that all the coefficients on `agriuse` and `agriuse2` are statistically insignificant. This means that we cannot find any robust inverted U-shaped relationship. There could be a few reasons behind the absence of such a relationship. First, if there is water stress crop and animal meat, output productivity decreases (Osakabe, 2014), meaning

that output will only decrease with increased water stress. Another reason is that there needs to be innovation in productivity when water becomes scarce to have an inverted U-shaped relationship. However, during the last few decades, there were few significant scientific breakthroughs on crops or meat using less water, so there is no reason to have an EKC relationship. The third reason is that this is based on EU data, and compared to the world, the EU produces fewer crops and meat and, therefore, could have less money spent on making output efficient. The same analysis based on areas with high crop or meat output might give different results. Fertiliser could also be used as a proxy for Y_{it} because if agricultural output increases so will the use of fertilisers. The regression results are below.

| | (1) fertiliser |
|--------------|-----------------------|
| agriuse | -.375 (3.556) |
| agriuse2 | .019 (.145) |
| _cons | 223.445*** (5.913) |
| Observations | 163 |
| R-squared | .001 |

Standard errors are in parentheses.

*** $p < .01$, ** $p < .05$, * $p < .1$

The same post-estimation tests were used for this regression. There was no evidence for endogeneity; however, there is heterogeneity in the data, so cluster standard errors are used. We can see the results are insignificant. This means we cannot use fertiliser to model freshwater dynamics with agricultural growth. Fertilisers are correlated to water quality and not the availability of freshwater (Boretti & Rosa, 2019). Therefore, the regression result has some soundness behind it.

From the econometric model, Y_{it} could be agricultural growth or net agricultural output. Below is the analysis relating agricultural growth and water utilisation on levels and logarithms.

The above regression uses instrumental variables for agriuse and clustered standard errors. The regression above used the precipitation variable (National Rainfall Index) as an instrumental variable. The endogeneity test showed that agriuse data is correlated with the error term, so the variable is endogenous. There is endogeneity because of the simultaneity between agriuse and agri_growth or

lnagri_growth. Simultaneity is when changes in X cause changes in Y, and changes in Y cause changes in X. Freshwater available and agricultural output are jointly determined (Perrings, 2005). Agricultural output needs freshwater resources, and a lack of freshwater can affect agricultural output, so there is a reason for simultaneity. Therefore, an instrumental variable is required. The instrumental variable needs to be independent of u_{it} (Exclusion criterion). Precipitation is exogenous to *because rainfall is random. Therefore* exclusion requirement is satisfied. Another requirement for the instrumental variable is to be strongly correlated with agriuse (relevance criterion). A weak instrument can cause biased and inefficient estimates. The minimum eigenvalue of a matrix analogue of the F-statistics was used to estimate if the precipitation variable is a weak instrument (Stock & Yogo, 2005). Using Stock and Yogo's (2005) post-estimation method, the F-statistic value was 18.20, so at 5% significance, we can say that precipitation is not a weak instrumental variable. Next, the fixed effect model was checked to see if it was a reasonable assumption. In a fixed effect model, α_i is time-invariant and can be correlated with the regressors. If α_i is purely random, linear panel data regression will be less efficient than general least square estimation. However, using a random effect model will give inconsistent results if it is a fixed effect model. Hausman test for random effects showed it robustly rejected that α_i is random effects. Therefore, it is more appropriate to perform fixed effects panel regression. Using all the specifications above, we can see that agricultural growth and water utilisation do not have a robust inverted U relationship. One reason is that we are using EU countries to analyse the relationship; different countries have different total agricultural outputs relative to their water resources and technology. However, this difference is not considered when growth rates are considered, which gives us the wrong results. So, a better analysis will be with the total agricultural output.

| | (1) | (2) | (3) | (4) |
|--------------|--------------------|-------------------|-------------------|--------------------|
| | agri_GDP | agri_GDP | lnagri_GDP | lnagri_GDP |
| agriuse | 1.928*** (.564) | -2.979 (2.278) | | |
| agriuse2 | -.07*** (.022) | .096 (.074) | | |
| pop | | -.046 (.07) | | -.017*** (.004) |
| fertilizer | | .014 (.019) | | -.003** (.001) |
| employ_agri | | .007* (.004) | | -.001** (0) |
| lnagriuse | | | .468*** (.099) | .506** (.216) |
| lnagriuse2 | | | -.005 (.028) | -.081* (.048) |
| _cons | -.502 (1.135) | 4.334 (3.49) | .966*** (.116) | 2.619*** (.554) |
| Observations | 143 | 83 | 143 | 83 |

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

The fixed-effects regression below uses agricultural output as the dependent variable, with the other regressors and precipitation as an instrumental variable. The results also use clustered standard errors.

The above regression proves the U-shaped relationship between agricultural output and water utilisation. First, if we check column 1, we can see $\beta_2 > 0$ and $\beta_3 < 0$ at a 1% significance level. The results from column 1 show a statistically robust inverted U-shaped relationship between agricultural output and water utilisation. When we add other explanatory shift variables, the relation becomes insignificant. When the regression is done on the logarithm relationship, we can see that the model is more robust. First, let us analyse the shifter variables used in the regression. The coefficient on population, fertiliser, and agricultural employment show that those are negative and significant, at least at a 5% significance level. This result means that an increase in these variables will shift the inverted U-shaped curve downwards. The reason behind such shifts is that as these variables increase, there is an increase in demand for agricultural output, which will make the economy reach the turning point sooner (the agricultural economy will be water-stressed sooner).

The turning point for the EU is about 13.77 to 22.72 (using regression results from columns 1 and 4). The result shows that when the withdrawal for agriculture is 13.77% to 22.72% of total water resources, the agricultural output will fall due to water scarcity. This gives evidence that the neoclassical growth model using freshwater as a non-excludable endogenous scarce input can be used to model the agricultural sector in the EU. The analysis shows that countries like Hungary, Croatia, Greece, France, Finland, Estonia, and Spain have reached the tipping point in water utilisation. From the data, the growth rates of agricultural output for these countries showed a slowing down, and for some countries, growth rates are negative and decreasing further (Estonia, France, Hungary). The data also showed that the percentage of agricultural output of total GDP is on a downward trend. From the results, we can see that there is a strong inverted U-shaped relationship between water utilisation and agricultural output. The reason behind this inverted U-shaped relationship can be answered using the model. In the model, we took the appropriation cost of supplying water as a function of water stress. This function was increasing in water stress. So, as water stress increases, supplying water becomes more expensive, which makes agricultural production more expensive. The higher costs because of water stress are because when water becomes scarce, the economy needs to find and invest in new freshwater resources, building dams, pipes, etc. Also, the issuing government will intervene and restrict water utilisation if serious scarcity exists. All these will constrain the agricultural output.

II. EKC Relationship between Water Scarcity and Agricultural Output

From the EKC literature, we learned that environmental degradation would have an inverted U-shaped relationship with increased output. Depleting limited freshwater can be seen as environmental degradation, such as deforestation. So, from the literature, water utilisation can be set up like this

$$W_{it} = \beta_1 + \gamma_i + \beta_2 Y_{it} + \beta_3 Y_{it}^2 + X_{it} + e_{it}$$

The regression below shows agriuse used as a dependent variable. Here, agri_growth and agri_GDP variables are endogenous, and to solve this problem, agricultural raw materials import was taken as an instrument. Using the same specification methods from the section above, it is tested that agricultural raw materials import is a strong instrument. Also, agricultural raw materials import is independent of e_{it} because it is highly unlikely that raw materials import will have a causal impact on water utilisation. The Hausman test for random effects showed that γ_i is a random effect, so random effects panel regression will give more efficient estimates. Another major problem with this regression is that it is assumed that the variance of the idiosyncratic error term e_{it} is constant. To check if the data is homoscedastic, we perform a Breusch and Pagan Lagrangian multiplier

test for random effects. This test shows that the null hypothesis of constant e_{it} is rejected, so we have heteroscedastic data. Because we are using EU country data, there is a possibility of clustering, so we need to use cluster robust standard errors for proper inference.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|--------------|-------------------|------------------|------------------|------------------|-------------------|---------------------|
| | agriuse | agriuse | agriuse | agriuse | agriuse | agriuse |
| agri_GDP | -2.235 (2.542) | | | 1.607* (.831) | 1.687** (.768) | |
| agri_GDP2 | .137 (.162) | | | -.06* (.036) | -.064* (.034) | |
| irrigated | .183 (.139) | .387 (.244) | | | | |
| pop | .059 (.146) | .07 (.129) | .046 (.089) | .095 (.087) | | |
| agri_growth | | -.31 (.258) | -.006 (.443) | | | .437 (.514) |
| agri_growth2 | | -.002 (.008) | 0 (.007) | | | -.006 (.009) |
| _cons | 8.116 (7.212) | 1.743 (2.204) | 5.4** (2.167) | .392 (3.596) | 1.713 (2.819) | 6.457*** (1.887) |
| Observations | 48 | 48 | 152 | 153 | 153 | 152 |

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

From the regression above, we can see that the coefficients of agricultural growth are insignificant. Therefore, water utilisation does not follow an EKC trend with agricultural growth. The shifter variables used are also insignificant in all the regressions. This is because the use of fertiliser and population does not affect the change in water utilisation for agriculture. The regression above shows significant coefficients on agri_GDP and agri_GDP2 (*agri_GDP2*) are significant (columns 4 and 5). The coefficients on agri_GDP and agri_GDP2 are important in identifying the relationship's trajectory. We need to use a one-sided test using the normal distribution (not the student's t distribution because it is a random effect panel regression) to check if the coefficients are significantly less than or more than zero.

From columns 4 and 5, the z-values for the coefficient of agri_GDP are 1.93 and 2.21, respectively. The critical value for the 5% significance level for standard normal distribution is 1.645; we can say with 95% confidence that the coefficient of

agri_GDP is positive. For the coefficient of agri_GDP², the z-values are -1.66 and -1.91; we can say with 95% confidence that the coefficient is negative. This shows that there is an inverted U-shaped relationship between agriuse and agri_GDP. This proves an EKC relationship between water scarcity and agricultural output.

The threshold at which water utilisation will start falling with greater agricultural output is about 13.18 to 13.40 billion dollars (coefficient values from the above regression table columns 4 and 5). The countries that crossed this threshold before 2017 (because water data was only available till 2017) were Poland, Netherlands, Germany, Spain, Italy, and France. For Germany, Netherlands, and France, there is a downward trend of freshwater withdrawal for agriculture, but there is no downward trend for Italy, Spain, and Poland. However, we cannot entirely deny the EKC trend from this observation because the data set is concise. Future data on freshwater withdrawal might give us some more insights. This phenomenon could be because when water becomes very scarce, the government will restrict how much water can be used for agriculture. Also, if water is becoming scarce, farmers can use better irrigation techniques that efficiently use the water supply (Molden, 2007). The data uses EU data not from extensive agriculture-producing regions; therefore, when water becomes scarce, the EU will shift from producing agricultural output to importing it (similar to the pollution haven hypothesis; Fracasso, 2014). Also, with the EU being a very environmentally conscious region, we might see a shift in people's preferences and dietary routines. The standard agricultural policy of the European Commission aims to ensure that agriculture follows the EU's water policies. They have made a Green Direct Payment system where farmers must comply with mandatory practices that increase the soil's ability to retain more water and get monetary benefits. New policies also support farmers trying to use innovative techniques to do farming. All these measures support an EKC relationship between water utilisation and agricultural output.

Research Evaluation

I. Analysis Shortcomings

Data on water utilisation was 5-year averages. A more dynamic and better estimation would be possible if more frequent water utilisation data existed. Also, the EU region is not very agriculturally dependent globally. Hence, there is an inverted U-shaped relationship because they can shift their economy to a sector where the economies have a comparative advantage. So, regions like South Asia or Southeast Asia, where agriculture is their primary agricultural growth, may not have an inverted U-shaped relationship. Also, the EU has been very environmentally conscious in recent years, which could be another reason these countries are

shifting to more environmentally and less water-straining production methods (van Dijk, 2015). Another major problem due to the lack of data is how water pollution and urbanisation will affect the agricultural ecosystem. For example, agriculture is primarily done in rural areas. If there is water scarcity, workers in the farming sector will migrate to other areas, causing a detrimental effect on the output. Also, fertilisers get washed up into the rivers and lakes, which causes water pollution, and this will cause freshwater resources to deplete faster. If data is available, such variables should be included in the research to find if there still is an inverted U-shaped relationship. Future research should also be done on agrarian economies so there can be a comparative study between regions.

II. EKC Shortcomings

The Environmental Kuznets Curve gives an excellent theory of the model relating to the environment and economic growth. Most research showed that in recent years, developed economies have reduced their pollutant emissions. Beckerman (1992) asserted that economic growth in developing countries would reduce environmental degradation. However, in recent years, environmental degradation has been increasing faster than economic growth in developing countries; examples of this phenomenon are Indonesia, the Philippines, and Thailand (Economist, 1993). Often overlooked from EKC analysis is that even if a particular pollutant decreases with economic growth, societies tend to create more different toxic pollutants (Dasgupta et al., 2002). There is only data on the well-known pollutants; therefore, research was only done on those pollutants. Thousands of toxic pollutants that can be disastrous for the world are still untested and unregulated (Dasgupta et al., 2002). Hydrological research showed that a lack of freshwater resources is terrible for the ecology, affecting the agricultural output (EEA, 2009). Such indirect effects are not included in the EKC model. Researchers have acknowledged that if pollution continues, the environment will lose its ability to respond to high demands. Most EKC literature assumes countries should continue their usual economic growth trend. EKC encourages unrestricted economic growth and believes that environmental degradation will eventually start to fall. However, this is very unsustainable. EKC critics say that fixating only on economic outputs and allowing temporary environmental damage is immensely problematic (He, 2003). Once certain environmental limits have been surpassed, there is no going back to original conditions, limiting economic output. Also, EKC does not consider other environmental issues like animal extinction; no money or time can revert this change. A significant theory behind the shape of the EKC is that when pollution increases, citizens will start to invest in conservation practices when they reach an amount of wealth. However, this is only true if the environmental damage is reversible (Mills & Waire, 2009). Freshwater depletion is an irreversible ecological degradation because the technology to recycle water at a large scale that can be used for irrigation for agricultural output is unavailable.

EKC suggests that developing countries should focus on economic prosperity and that the environment will be conserved in the long run. Nevertheless, critics indicate that developing nations should embrace sustainable development (Gara, 2019). Environmental degradation has an external cost effect. However, most EKC literature on developed economies showed that economic degradation decreased with economic growth; however, the amount of pollution that the Industrial Revolution caused in the world is immense. The pursuit of economic growth caused climate change and a dangerous world for future generations. The EKC theory also downplays how much investment and technological advancement are required to fix the environment (Neumayer & Van Alstine, 2010). It also does not specify its duration to decrease environmental degradation after the tipping point. Therefore, although EKC could be an excellent model to relate water shortages and agricultural output, it should not be used to make significant environmental policy decisions.

Conclusion

The purpose of this study was to model water utilisation and the agricultural sector. The panel of 27 EU member countries was used to find how water shortages could affect agricultural output. The empirical analysis strongly supports an inverted U-shaped relationship between water scarcity and agricultural output production. It shows that water utilisation will grow with agricultural growth and then reach a tipping point where the farm output production. The model suggested in the methodology can be used to model water scarcity and agricultural production. From this analysis, we cannot claim with certainty that some EU countries will overcome the water scarcity problem more efficiently. Some EU countries are well endowed with natural freshwater reserves, which may help them improve agricultural output. Proper infrastructure is also required; a country might have massive freshwater resource reserves but lack the capacity to withdraw water efficiently. Extending this analysis to countries where agriculture is their primary sector is suggested for future research on agriculture and freshwater. Further research should also include how water scarcity will affect global agriculture trade and inequality.

The empirical study also proves that water scarcity followed the EKC trajectory, where water utilisation will fall with greater agricultural output. However, using the EKC theory to make environmental policy on water scarcity is unjustified. EKC can be a guideline; however, it should not be the only justification for increasing agricultural growth and hoping the economy will automatically fix itself.

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