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Income Inequality and Regional Development Policies in Bangladesh: Trends and Ways Forward

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Abstract

Since the early 1990s, Bangladesh's economic growth has been hampered by increasing income inequality and a steady gap between the rich and the poor. Using paneled data from 2001 to 2020, the trend of income inequality and regional development policies across 63 districts in Bangladesh was examined. Key indicators for estimating income inequality were employed, including the Gini coefficient and the Coefficient of Variation, to investigate temporal shifts in regional income inequality within Bangladesh. An empirical analysis was undertaken to ascertain the prevalence of any changes. Subsequently, the cumulative impact of the Bangladeshi government's regional policies on regional income inequality was assessed, drawing upon the previously analyzed and estimated research findings. Finally, the overall changes in regional income

inequality are summarized, highlighting the significant impact of the government's regional policies and offering actionable policy recommendations for growth and ways forward.

Keywords: income inequality, development policies, economic growth.

1. Introduction

Bangladesh has outperformed other emerging nations in two distinctive ways since gaining its independence in 1971. The term "regional economic structure" refers to the composition and patterns of various regional economic elements, such as production, employment, consumption, trade, and gross regional output (Thakur et al., 2012). This structure can be employed to forecast the impacts of economic decisions and planning as well as to elucidate regional economic changes (Glasson, 1974). The strengths and weaknesses of a region's various industries shape its economic structure (Islam et al., 2015). Generally, a region's economy expands as its various industries grow over time. Changes in regional economic activity influence the workforce, businesses, and governments within a region. Due to economic growth in the early 2000s and trade liberalization programs implemented in the 1990s, Bangladesh has succeeded in reducing overall poverty. However, societal-level inequality persists. More specifically, social inequality continues to pose a significant obstacle to future goals and aspirations. The Kuznets hypothesis, attributed to economist Simon Kuznets (Oshima, 1992), posits that income inequality initially increases in growing countries, followed by a shift toward a more equitable distribution. Building on this economic theory, Matin (2017) concludes that inequality has endured in Bangladesh despite advancements in specific sectors.

Economic inequality can be defined as the disparity between a community's wealth and income. According to the World Bank and the Bangladesh Bureau of Statistics, the Gini index for the country has trended upward since the 1990s. This indicates that inequality has been rising, even though many individuals have migrated to urban areas in pursuit of improved lifestyles. Since the 1980s, the top

1% of national income in Bangladesh has increased. On a positive note, only 9% of Bangladeshis lived on less than $1.90 per day in 2018, a significant decline from 90% in 1972. Food insecurity serves as an accurate indicator of poverty in less developed countries. Ozughalu (2016) notes that it is common for families to allocate more funds to food-related expenses than to non-food items. The Food and Agriculture Organization (FAO) reports that global hunger is increasing, echoing Thomas Robert Malthus's centuries-old prediction that the food supply would be unable to keep pace with population growth. A 2021 FAO report based on a regional analysis of food security offered insights into food accessibility in Bangladesh. It stated that over 32% of Bangladeshis face food security issues, categorizing Bangladesh alongside nations like Cambodia and Nepal. When compared to its 2016 level of approximately 25%, Bangladesh's current poverty rate stands at about 20%. However, the pace of poverty reduction has decelerated since 2016. Asifur (2021) observes that poverty has declined more slowly in urban areas compared to rural ones during this period. This trend is concerning for the future, especially as Bangladesh's relatively young population—often referred to as a demographic dividend—is increasingly migrating to urban areas.

The report also indicates that Bangladesh's economy has experienced remarkable growth over the past decade. Coupled with the poverty rates, this suggests an urgent need for reevaluating wealth distribution. According to a Household Income and Expenditure Survey focusing on "Poverty" and "Extreme Poverty" in Bangladesh (World Bank Group, 2018), the rate of poverty reduction has recently slowed. Despite developmental progress, significant poverty reduction in Bangladesh did not occur until the year 2000. The poverty headcount

ratio at $1.90 per day (2011 PPP) averaged 38% during the 1980s and 1990s but fell below 20% from 2005 to 2016. Since 2000, although the economy has grown at rates comparable to previous decades, poverty has decreased disproportionately more relative to its rate of growth.

Arthur Lewis (Premdas & St. Cyr, 1976) famously stated that development must be equitable, as it does not commence simultaneously across all economic sectors. Development is indeed a complex phenomenon. Contrary to general trends, demographic and social developments in Bangladesh seem to have preceded economic growth. Therefore, the relationship between regional disparities and income growth may also be an exception. Income distribution is crucial for economic study. Known as income inequality, the unequal distribution of income among a population is a pressing issue today. Despite significant progress, including high growth rates, women's empowerment, and improvements in mortality and life expectancy, Bangladesh continues to grapple with severe challenges like income inequality and poverty. These issues pose a significant threat to the nation's prosperity. Income inequality surged dramatically during the global financial crisis of 2007–2008 (Mahmood, 2017). This spike in economic inequality exacerbates poverty, unemployment, and other societal issues. The impact of inequality on society, families, the economy, and communities can be extensive. A key focus of the current international development agenda, known as the Sustainable Development Goals (SDGs), is the growing wealth disparity. The 10th SDG emphasizes the need to reduce inequality both within and among nations to foster greater social justice. The Gini coefficient, ranging from 0 (indicating equal incomes for all) to 1 (where all income is concentrated in the

hands of one individual), serves as a metric for assessing the level of inequality in each nation or region.

Bangladesh has a history of implementing various initiatives aimed at local development and reducing income disparity. These include land reforms to benefit small farmers, rural development programs to improve access to essential services, export-oriented industrialization to attract foreign investment, microfinance programs primarily targeting women, and social safety net programs for the vulnerable population. These initiatives have been largely successful in reducing poverty and improving living conditions, particularly in rural areas.

This study employs a comprehensive approach to examine income inequality in Bangladesh. Statistical measures like the Gini coefficient and coefficient of variance are used to quantify income inequality and its variability. The research assesses interregional income inequality by using the per-capita GDP of each district, with data spanning 20 years. The study also adjusts for real GDP using the GDP deflator index. Through a blend of historical deduction and logical analysis, the paper evaluates the trend of development policies, the income inequality of eight major districts, and the impact of regional development policies on income inequality between regions and proposes ways forward. A graphical representation is created to illustrate the changes in local income disparity due to these policies.

The rest of the article is structured as follows: Section 2 covers a review of regional development policies and income inequality. The methodology is described in Section 3. Section 4 discusses and analyzes policy implications and resource allocation. Section 5 presents recommendations, ways forward, and a conclusion.

2. Bangladesh Regional Development Policies

Bangladesh's regional development policies have evolved through four main phases to address disparities in social welfare, infrastructure, and economic progress. The initial ten-year plan (1973–1985) aimed to balance regional development and reduce inequalities by establishing regional development bodies (Bangladesh Planning Commission, 2009). While these efforts aided industrialization in underdeveloped regions, their effectiveness was limited by institutional and financial constraints, as well as a neglect of social and environmental sustainability. Studies by Raihan et al. (2015) and Rahman et al. (2018) found that although regional policies reduced disparities in income and employment, they did not necessarily lead to equitable distribution of benefits. Structural issues like unequal access to resources remain a challenge. To address these, policies should focus on social inclusivity, community involvement, and the expansion of SMEs in underdeveloped areas (Rashid, 2016). The East Pakistan Industrial Development Corporation (EPIDC) in the 1950s and the Bangladesh Power Development Board in the 1970s were significant in fostering industrial development and infrastructure, respectively (Rahman et al., 2017).

The second phase of Bangladesh's regional development strategies, spanning from the early 1980s to the late 1990s, shifted its focus toward rural development and poverty alleviation. The ten-year plan (1981–1990) built upon earlier achievements and introduced new policies for balanced regional growth. These included the creation of special economic zones, a rural electrification board, and microcredit programs. Despite these efforts, studies indicate that more rigorous monitoring and evaluation are needed. For example, Islam et. al (2016) found that the Rural Employment Generation Program (REGP) was effective in

fostering rural development, while Ahmed et al., (2016) emphasized the importance of rural infrastructure investments. However, (Khan et al., 2019) noted that the impact of such investments has not been adequately assessed. Khatun and Ahsan (2020) highlighted the influence of external variables like global economic conditions on Bangladesh's regional development. Their study also concludes that future strategies should be evidence-based, flexible, and involve local communities for effective regional development.

During the late 1990s and early 2000s, Bangladesh's regional development policies entered their third phase, shifting focus toward inclusive and sustainable growth. This period saw an increased emphasis on poverty reduction and regional development in the third ten-year plan. Initiatives were launched to improve the socio-economic conditions of marginalized groups through community-based organizations, the expansion of primary healthcare in rural areas, and the provision of microcredit. Ahmed et al. (2017) highlighted the role of private sector investment in fostering regional development, emphasizing the need for better market access and financial services for SMEs in underdeveloped areas. Similarly, Khan (2020) found that regional integration, particularly through cross-border economic corridors like BCIM-EC, could be vital for economic growth and regional development. Alongside private sector-led growth, the policies also focused on human capital development, social protection, and environmental sustainability. Alam et al. (2019) noted the importance of investing in health and education for human capital development and poverty reduction. They also stressed the need for better governance, institutional capacity, and stakeholder involvement in the formulation and execution of regional development policies.

The evolving landscape of regional development policies in Bangladesh has been the subject of academic scrutiny. While there is no universally accepted 4th or 5th phase of these policies, scholars note emerging trends and potential new eras. According to Ahmed et al. (2020), regional cooperation, particularly in South Asia, has become increasingly important for fostering economic growth in disadvantaged regions of Bangladesh. Sultana and Barua (2020) highlight the role of technology and innovation in economic development, emphasizing the need for policies that encourage technology diffusion and human capital development. Sarker et al. (2020) discuss the growing importance of sustainability and green growth, advocating for investments in green infrastructure and sustainable practices. Kabir et al. (2020) and Alam et al., (2021) focus on the digital economy, stressing the need for digital literacy and infrastructure to foster digitalization. Rahman et al. (2021) and Huq et al. (2021) emphasize the importance of social and human development and entrepreneurship, respectively, for equitable growth. Bhutia (2021) discuss the role of regional cooperation programs like the Bangladesh-Bhutan-India-Nepal (BBIN) Motor Vehicle Agreement in fostering regional connectivity. Despite these advancements, challenges such as institutional capacity and inadequate governance remain. Table 1 provides the statistics for the eight major regions and districts, which include data on GDP, GDP per capita, GDP growth rate, and GDP per capita growth rate.

Table 1. Descriptive statistics of Bangladesh Regions/Districts

Regions	**Districts**	Statistics of GDP, GDP growth rate, GDP per capita, and GDP per capita growth rate for the 8 major Regions and their Districts.			
		GDP (in billion USD)	GDP per capita (USD)	GDP Growth Rate (%)	GDP per Capita Growth Rate (%)
Dhaka	Dhaka, Faridpur, Gazipur, Gopalganj, Kishoreganj, Madaripur, Manikganj, Munshiganj, Narayanganj, Narsingdi, Rajbari, Shariyatpur,	316	136114	7.3	6.7
Chittagong	Bandarban, Brahmanbaria, Chandpur, Chittagong, Comilla, Cox's Bazar, Feni, Khagrachhari, Noakhali, Rangamati	166	19740	6.5	5.5
Rangpur	Dinajpur, Gaibandha, Kurigram, Lalmonirhat, Nilphamari, Panchagarh, Rangpur, Thakurgaon	75	30620	5.2	4.1
Khulna	Bagerhat, Chuadanga, Jashore, Jhenaidah, Khulna, Kushtia, Magura, Meherpur, Narail, Satkhira	53	73761	5.7	4.9
Sylhet	Habiganj, Moulvibazar, Sunamganj, Sylhet	40	41493	6.6	5.0

Rajshahi	Bogura, Chapai Nawabganj, Naogaon, Natore, Pabna, Rajshahi, Sirajganj	25	25879	4.5	3.5
Barishal	Barguna, Barishal, Bhola, Jhalakathi, Patuakhali, Pirojpur	19	35647	4.6	3.7
Mymensingh	Jamalpur, Mymensingh, Netrokona, Sherpur, Kishoreganj, Tangail	15	33627	5.2	4.3

Note: GDP in PPP Terms: GDP in purchasing power parity (PPP) terms adjusts the gross domestic product by considering the relative cost of local goods, services, and inflation rates of the country.

1.1 Studies on Income Inequality Estimation in Bangladesh

Multiple studies have examined income inequality in Bangladesh, particularly contrasting urban and rural areas. Imam et al. (2018) used the Theil index to confirm the findings of Hossain et al. (2019) that there is more economic inequality in urban areas than in rural areas. Both studies also found that areas with higher economic activity and educational attainment had greater income inequality. Sarker (2020) reached similar conclusions, as did Alam and Paramati (2016) and Akhtaruzzaman et al. (2017), who also used Household Income and Expenditure Survey (HIES) data to show a marginal increase in income disparity from 2010 to 2016, particularly in urban areas. Huda et al. (2018) used a decomposition analysis to identify household income sources, occupation, and education as significant determinants of income inequality, with education having the most substantial impact. These studies collectively emphasize the need for policies targeting inclusive growth and reducing wealth disparity, especially in Bangladesh's urban areas.

Sen et al. (2014) used HIES data from 2000, 2005, and 2010 to analyze regional welfare gaps in Bangladesh, dividing the country into eastern and western regions. They found that, despite some narrowing, a significant welfare gap persists between the two regions, largely due to the eastern region's benefits from urbanization and unequal access to international remittances. Bhattacharya et al. (2018) investigated the allocation of public expenditure, finding that more developed regions tend to receive higher allocations even after adjusting for various factors. This pattern holds for specific public expenditure categories like roads, health, and education. Basher et al. (2021) used satellite data on evening lighting as a proxy for economic activity and found that less developed sub-districts are catching up to more developed ones, a phenomenon termed "club convergence." However, the speed of this convergence is slow compared to similar estimates in the existing literature. According to the Center for Sustainable, Healthy, and Learning Cities and Neighborhoods (SHLC) and the Bangladesh Bureau of Statistics, each of Bangladesh's eight major regions faces specific challenges. Geographical location, economic activity, social dynamics, and environmental conditions are just a few of the variables that have an impact on these challenges. These challenges are also said to be major drivers behind the income disparity within these regions. Table 2 provides a general overview of the problems typically faced by each region, including the specific government policies enacted to tackle them, among others.

Table 2. Overview of regional challenges in Bangladesh

Region	Overview of problems faced within each region and their enacted policies		
	Specific Problems Faced	**Effect on Income Inequality**	**Policies Enacted**
Dhaka	Overpopulation, urban congestion, high living costs, pollution, and environmental degradation.	Urban congestion and high living costs exacerbate inequality; lower-income groups struggle more.	Urban planning and development policies, affordable housing projects, and public transportation investments.
Khulna	Climate change impacts, rising sea levels, increased salinity, and economic challenges due to declining traditional industries.	Climate change impacts lead to job losses in traditional sectors, affecting lower-income groups.	Climate adaptation strategies, alternative livelihood support, and sustainable industry investment.
Chittagong	Port congestion, infrastructure challenges, and industrial pollution.	Port congestion and industrial pollution limit opportunities, impacting lower-income groups' health and economic prospects.	Investment in port infrastructure, environmental regulations, and economic diversification.
Rajshahi	Agricultural challenges like water scarcity, climate change impact on crops, and high air pollution levels.	Water scarcity and air pollution reduce agricultural productivity, affecting farming communities' income.	Sustainable farming support, financial act.
Barisal	Prone to floods and cyclones, limited access to healthcare and education in remote areas.	Frequent floods and limited-service access hinder economic growth and opportunity access.	Disaster preparedness, infrastructure development, healthcare, and education access improvement.
Sylhet	Landslides, soil erosion due to hilly terrain, and heavy reliance on remittances.	Reliance on remittances and landslides create economic instability, affecting incomes.	Economic diversification, sustainable land management, healthcare, and education access improvement.
Rangpur	High poverty rates, underdevelopment, and issues with agricultural productivity.	High poverty and underdevelopment lead to significant income disparities.	Poverty alleviation, agricultural technology investment, education, and healthcare access initiatives.
Mymensingh	Challenges with infrastructure development and connectivity and disparities in educational and healthcare access.	Infrastructure issues and educational and health disparities limit economic opportunities and exacerbate inequality.	Infrastructure projects, educational reforms, and healthcare initiatives for underserved areas.

2.2

2.3 Efficacy of the Government's Regional Policies

Dhaka, facing rapid urbanization, is contending with critical issues like housing shortages, traffic congestion, and pollution. Despite efforts by 42 management bodies and several regional plans, policymakers have struggled to manage this growth. The Planning Commission (2015) suggests that decentralization could be more effective than pro-growth strategies for Dhaka's future development. Khulna's growth, on the other hand, is slower due to limited resources and investments. Both cities have urban plans, but implementation faces challenges due to uncoordinated development and insufficient institutional support. The Bangladesh Planning Commission (2018) notes Dhaka's disproportionate population growth due to economic concentration, highlighting the need for balanced regional development.

Khulna has specific government policies like the Seventh Five-Year Plan and Sector Development Plans (SDP) of 2015. Projects like 'Climate Change-Adapted Urban Development in Khulna,' in collaboration with international donors, aim to enhance resilience against climate change. However, Rahman et al. (2011) observed that governmental and private investments in Khulna are limited, and the Khulna Development Authority (KDA) reported in 2002 that the city receives a smaller share of national resources compared to other regions. In Chittagong, the government's 2014 Strategic Master Plan for Chittagong Port, supported by the Asian Development Bank (ADB) and the Japan Fund for Poverty Reduction, aims to address port congestion and pollution. With a noted challenge like the port's shallow water depth, the port doesn't seem to be attractive to users of port services such as liners and shippers, thus affecting its economic potential (Awah et al., 2021).

The 2014 Agricultural Development Bank Act in the Rajshahi region provides financial assistance for agriculture-related enterprises. It aims to support local farmers and small to medium-sized agricultural businesses. Health policies in the Barisal, Sylhet, Rangpur, and Mymensingh regions, as per the Ministry of Health & Family Welfare (2018), include the Multisectoral Action Plan for Prevention and Control of Non-Communicable Diseases 2018–2025. This plan focuses on innovative financing, public awareness, multisectoral coordination, and strengthening the Non-Communicable Disease Centre (NCDC) to address social, environmental, and economic health determinants.

Despite Bangladesh's significant economic growth, numerous difficulties frequently impair the effectiveness of government policies. According to the World Bank (2019), around 22 million individuals in Bangladesh continue to live below the poverty line. A key issue contributing to policy ineffectiveness is bureaucratic inefficiency and red tape, which frequently lead to delays and difficulties in adapting policies to new information and changing circumstances. Bangladesh, rich in development prospects, can benefit significantly from prioritizing business creation and attracting more investment. According to the National Defence College's 2017 discussion, these initiatives are crucial for creating employment, introducing cutting-edge technology, and improving management skills, all of which play a crucial role in reducing the income gap.

Ferdous (2023) explored the challenges of inequality and prosperity in Bangladesh, drawing comparisons with Singapore's approach. Singapore's success is attributed to policies that include investments in research and development, technology importation, skilled labor, and the development of export

markets. This comparison highlights potential strategies for Bangladesh to emulate in its pursuit of successful development.

Additionally, the economic downturn in 2021 due to the COVID-19 pandemic made poverty in Bangladesh worse, with a sizable portion of the population falling below the poverty line and a widening poverty gap (Jamal, 2021). In response, the World Bank (2021) has recommended rebalancing the geographical allocation of development funds between rural and urban areas, especially given that one in five urban dwellers lives in poverty. This strategy aims to address the disproportionate impact of poverty in different regions of the country. Major causes of income inequality in Bangladesh include educational disparities, urban-rural income gaps, gender inequality, and the prevalence of the informal economy. District-level income is calculated by aggregating household income, which comprises various sources such as wages, self-employment earnings, and remittances. Data from the HIES 2000 and HIES 2016/17 surveys were used for these calculations. Inequality has increased in rural areas due to limited access for the extremely poor to new income sources like non-farm self-employment and remittances (Perobelli & Haddad, 2003). Similarly, the urban poor have limited access to these new income sources. Most anti-poverty initiatives have focused exclusively on rural areas. The study also notes the importance of factors like natural resources and human capital in income distribution (Guo & Hewings, 2001). The paper prefers using income over consumption as a measure of financial well-being based on theoretical justifications presented by Attanasio and Pistaferri (2016), who note that income is a more accurate and easier-to-measure indicator than consumption.

3. Methodology

This study examines income inequality across the eight major regions of Bangladesh, i.e., Dhaka, Chittagong, Khulna, Rajshahi, Barisal, Sylhet, Rangpur, and Mymensingh. The study employs a range of economic indicators for its analysis. These include GDP, which measures the total economic activity within a country, encompassing the value of all goods and services produced. The GDP deflator is used to adjust nominal GDP to real GDP, thereby providing a measure of inflation in the economy. Nominal GDP represents the total value of goods and services produced at current market prices without accounting for inflation. In contrast, real GDP adjusts nominal GDP for inflation, offering a more accurate depiction of economic growth. Population is another key factor considered in the study, as it influences a region's political, social, and economic characteristics, affecting both production and consumption. Per capita GDP, representing the average economic output per person, is often employed as an indicator of living standards.

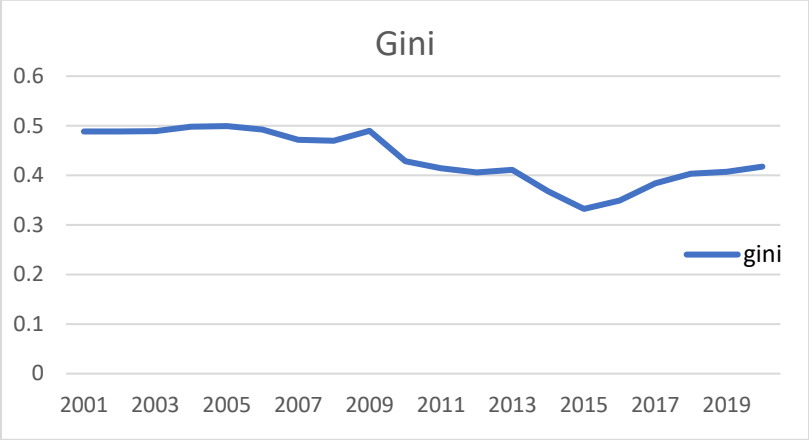
The Gini coefficient, an indicator of income disparity within a population, gauges how far away from equal distribution the wealth or income in a society is. The coefficient ranges from 0 to 1, with 0 denoting perfect equality (everyone in the population has the same income) and 1 denoting perfect inequality (one person owns all of the income), as shown in equation (1).

$$Gini = \left(\frac{1}{2n^2\, u}\right)\sum_{i}^{n}\sum_{j}^{n}|y_i - y_j| \qquad (1)$$

Here, u represents the average income of all the people in Bangladesh, y_i is the income of i region, y_i is the income of j region, and n is the population of the

object region and large-sized cities. Figure 1 depicts Bangladesh's national income inequality using the Gini coefficient.

Figure 1. National income inequality of Bangladesh using the Gini coefficient



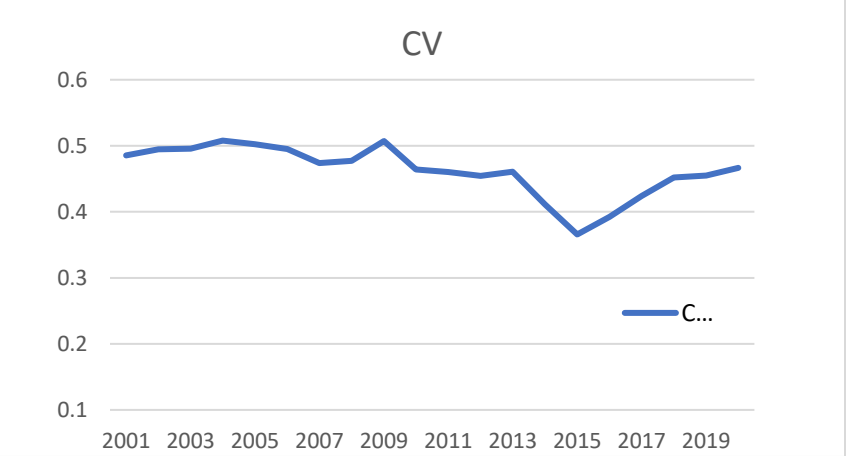
This graph illustrates the wealth disparity (income inequality) that existed across the nation up until 2009. Subsequently, the Gini index exhibited a declining trend from 2010 to 2015, signifying a reduction in income inequality during this period. However, post-2015, the Gini index reversed direction, albeit at a moderate pace, indicating a measured widening of the income gap.

Coefficient of Variation, a dataset's variability concerning its mean, is measured by the coefficient of variation (CV). It is determined as the data's standard deviation, reported as a percentage, divided by its mean. In statistics and economics, the CV is frequently used to compare the variability of several datasets with various scales or units of measurement. The CV offers a standardized measure of variability that can be compared across various datasets by expressing the standard deviation relative to the mean, as shown in equation (2).

$$CV = \frac{\sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \bar{y})^2}}{\bar{y}} \quad (2)$$

Here, y_i is the income per capita of i region, and $\bar{y}$ is the average income of all people. A larger CV implies a higher degree of dissatisfaction. Figure 2 depicts Bangladesh's national income inequality using the CV.

Figure 2. Measurement of income inequality using the coefficient of variance (national)



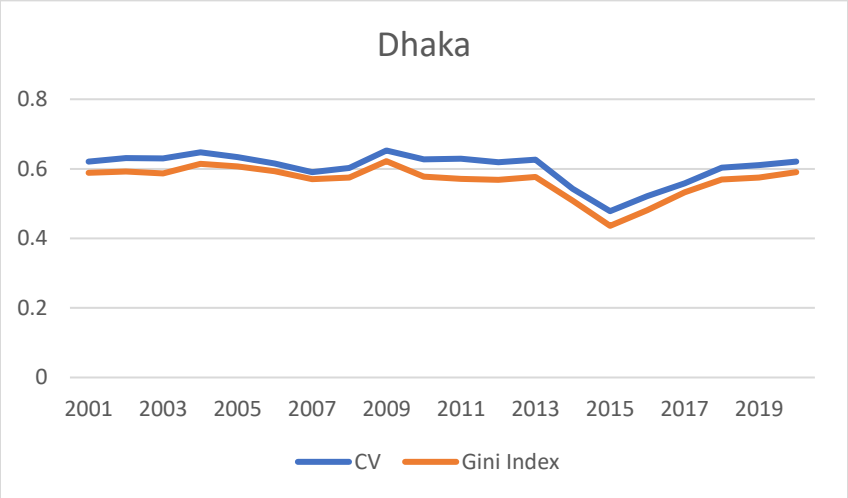
3.1 Regional Income Inequality Trend

Figures 3 through 9 provide a comprehensive overview of how we employed two key indicators—the Gini index and the coefficient of variance—to analyze the evolution of income inequality in Bangladesh over a two-decade span from 2000 to 2020. Specifically, we examined the trends in the Gini index across the eight major regions of Bangladesh. Subsequently, we offer a comparative analysis of these regional trends, utilizing both the Gini index and the coefficient of variance as metrics.

Dhaka, the capital and largest region of Bangladesh, comprises twelve sub-regions and has exhibited the highest levels of income disparity over the years.

Between 2001 and 2009, the Gini coefficient fluctuated between 0.53 and 0.62, while the coefficient of variation ranged from 0.62 to 0.65. These metrics indicate a moderately high level of income inequality. However, from 2011 to 2015, the Gini coefficient for Dhaka has shown a slight decrease, ranging between 0.65 and 0.47, suggesting a reduction in income disparity compared to the previous nine years. Similarly, the CV also declined to a range of 0.62 to 0.43 during the same period, indicating a less extreme level of wealth inequality. It's worth noting that when the CV is higher than the Gini coefficient, it typically suggests greater variability in wealth levels within the region (Figure 3).

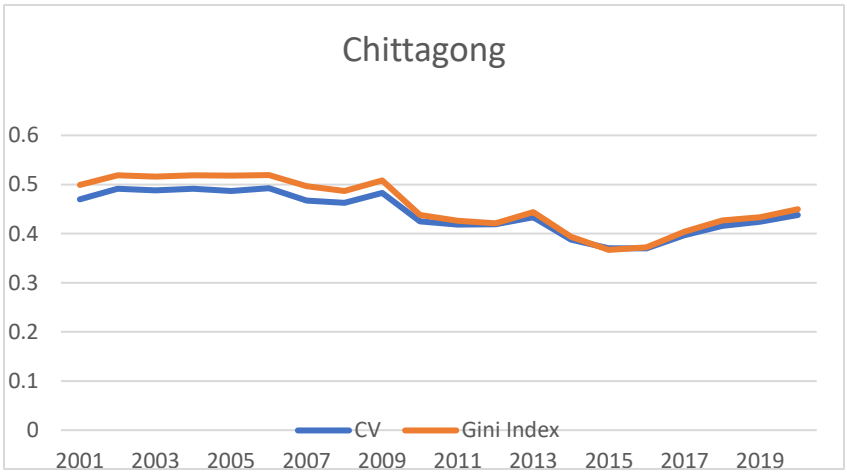
Figure 3. Measurement of income inequality using the Gini and coefficient of variance (Dhaka)



Chittagong, the second-largest city in Bangladesh, is divided into ten sub-regions and has shown notable trends in income inequality over the years. The Gini coefficient, a measure of income disparity, ranged from 0.50 to 0.52 between 2001 and 2009. However, it decreased to between 0.48 and 0.37 from 2009 to 2015, suggesting a reduction in income inequality compared to other cities. In parallel, the CV, another measure of income dispersion, was between 0.47 and 0.50 from

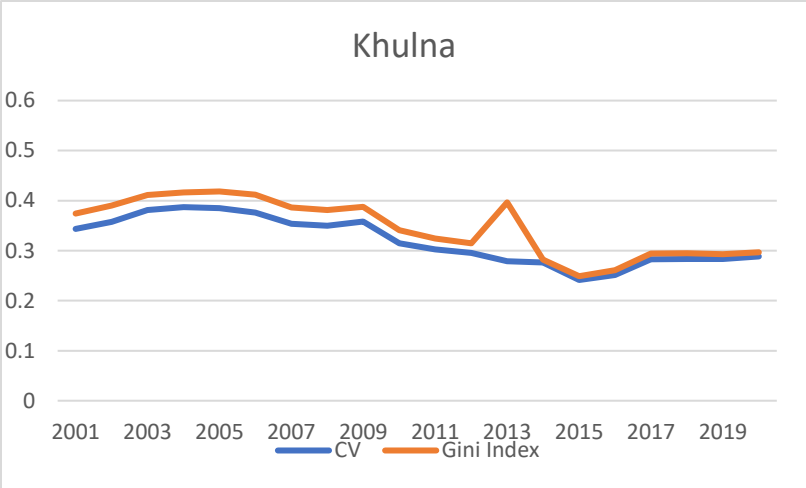
2001 to 2009 and declined from 0.42 to 0.36 from 2009 to 2015. This decline in the CV, when compared to the Gini coefficient, indicates a more equitable distribution of income and wealth among the population during that period (Figure 4).

Figure 4. Measurement of income inequality using the Gini and coefficient of variance (Chittagong)



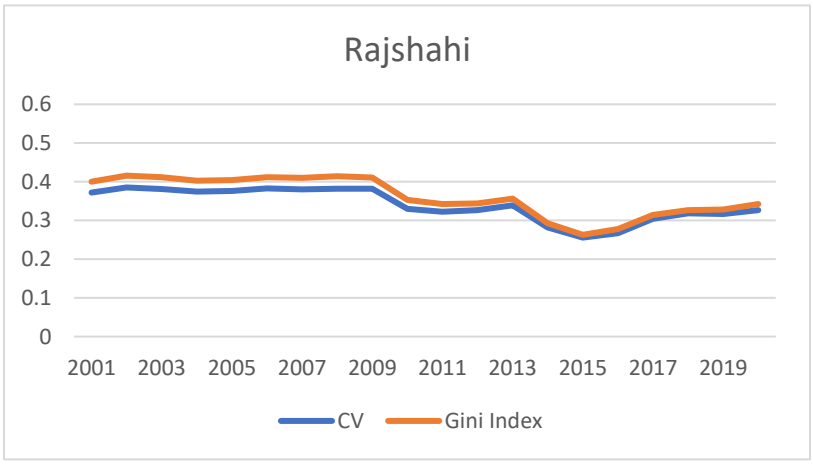
Khulna, Bangladesh's third-largest region, exhibits lower income inequality compared to the country's two largest cities, as evidenced by its Gini coefficient trends. In the first nine years, the Gini coefficient ranged from 0.37 to 0.41, but it decreased to between 0.42 and 0.25 from 2013 to 2016. Similarly, the CV also showed a trend toward reduced income equality. For the first nine years, the CV ranged from 0.34 to 0.39, but it declined to between 0.35 and 0.28 in the last eleven years. These metrics suggest that income distribution in Khulna has become more equitable over time, with only a slight increase from the year 2019 (Figure 5).

Figure 5. Measurement of income inequality using the Gini and coefficient of variance (Khulna)
The region of Rajshahi is divided into seven sub-regions and is not considered a large division.



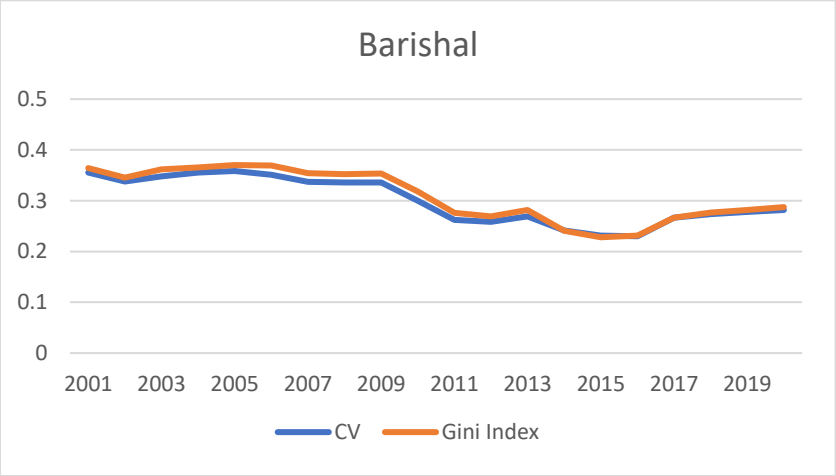
Over the first nine years, the Gini coefficient for Rajshahi ranged from 0.26 to 0.41, which is indicative of low to moderate income inequality within the context of Bangladesh. In the subsequent years between 2009 and 2015, the region saw a slight decrease in income inequality, ranging from 0.41 to 0.26, further solidifying its status as an area with low to moderate income inequality. The CV followed a similar trend; it ranged from 0.22 to 0.38 in the first nine years and declined to 0.26 by 2016 before picking up momentum in the following years. This also suggests a low to moderate level of wealth disparity in the area (Figure 6).

Figure 6. Measurement of inequality using the Gini and coefficient of variance (Rajshahi)



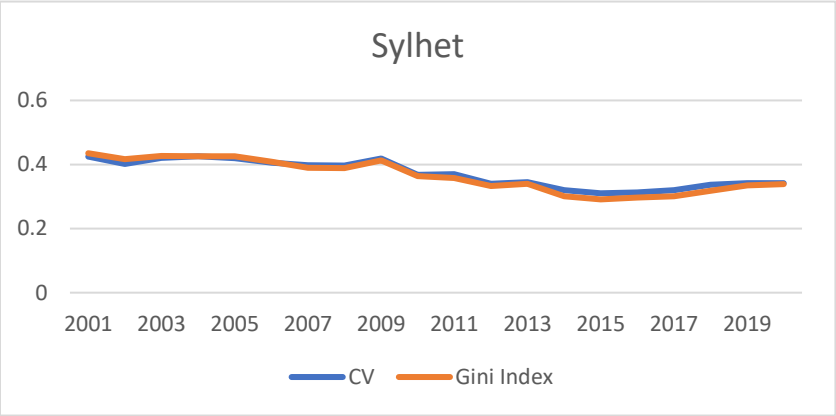
In Barisal, which is comprised of six sub-regions, income inequality has been decreasing. Both the Gini index and the CV saw a steady decline in numbers between 2001 and 2017. This trend suggests a steady reduction in income inequality in the region over time. The later years after 2017 show a rather steady increase in income inequality. This also indicates a relative decline in income disparity among the region's population over a long period of time (Figure 7).

Figure 7. Measurement of inequality using Gini and coefficient of variance (Barishal)



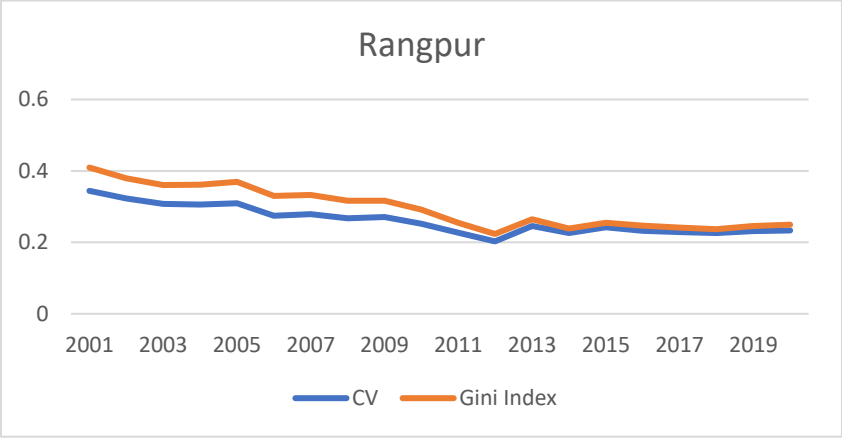
The analysis of Sylhet, which is comprised of four sub-regions, found that it exhibits the most stable Gini coefficient trends among all the major regions studied. During the initial five-year period (2001–2005), the Gini coefficient ranged between 0.42 and 0.37, indicating a high level of income inequality. In the years that followed, there was a steady decline. This steady trend underscores the significant reduction in income disparities within the region over the years.

Figure 8. Measurement of inequality using Gini and coefficient of variance (Sylhet)



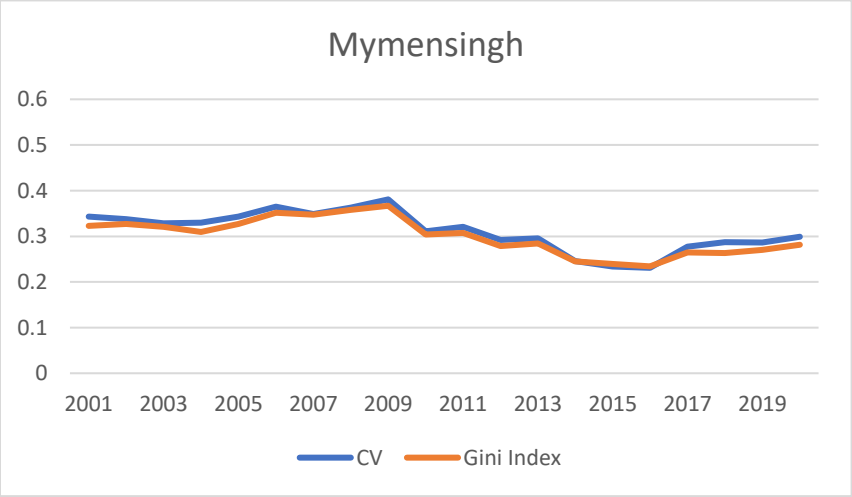
A notably similar trend was observed in the Gini coefficient for Rangpur to that of Sylhet, a region comprising eight sub-regions. The Gini coefficient declined sharply from 0.43 to 0.25 in the years 2001–2011 and remained steady until 2020. This suggests a low level of income inequality compared to other regions. When we examine the CV, the trend closely mirrors that of the Gini coefficient. Specifically, from 2011 to 2020, it remained almost stable at 0.24. This suggests a trend toward a decline in income inequality within the region's population (Figure 9).

Figure 9. Measurement of inequality using Gini and coefficient of variance (Rangpur)



The Mymensingh region, comprising six sub-regions, exhibits a highly variable trend in its Gini coefficient. The Gini coefficient reached its peak in 2009, with a Gini coefficient of 0.37. However, it declined to 0.23 by 2018, before steadily increasing between 2017 and 2020, a range that is still considered to represent a moderately low level of income inequality. The CV showed a similar trend as the Gini index, a steady but fluctuating depiction of income inequality in the region. The income inequality depicted in the eight major regions of Bangladesh all have a similar trend. While most of the regional policies enacted by the government have either failed or are ineffective, a portion of each of the graphs depicts a slight decline in income inequality, erasing the idea of a complete failure of the policies (Figure 10).

Figure 10. Measurement of inequality using Gini and coefficient of variance (Mymensingh)

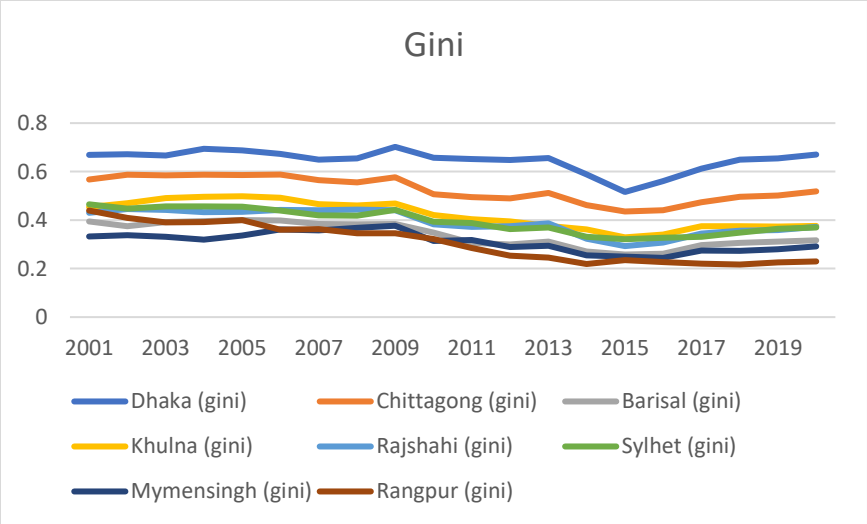


3.2Trend Comparisons Among Eight Regional Districts

It is evident that Dhaka, the most populous region, exhibits the highest Gini coefficient trend, followed by Dhaka and Chittagong, which show the next highest Gini coefficient trend. Upon examining the chart, it is evident that the trend in the

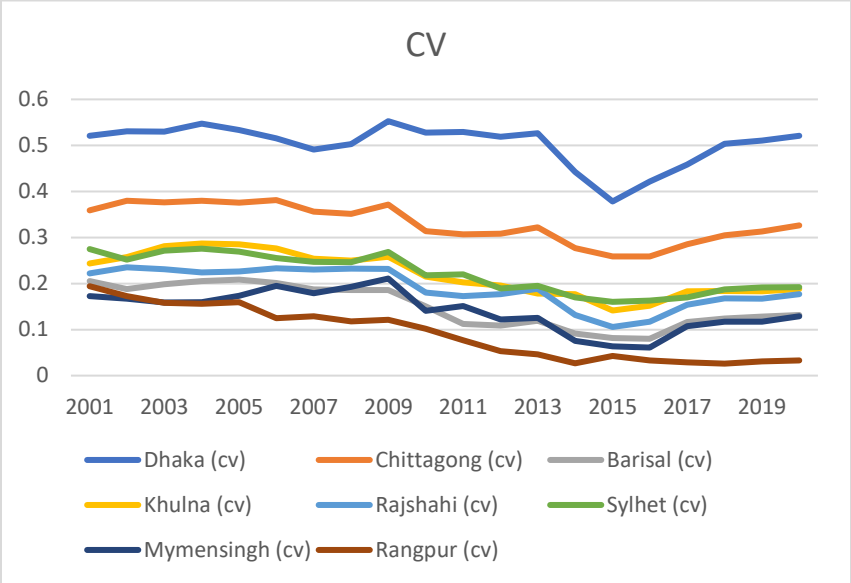
Gini coefficient has largely remained consistent across all regions over the past 20 years, except for a noticeable deviation in the Rangpur district. Specifically, the trend of the Gini coefficient in the Rangpur district has been decreasing from 2011 to 2020, signaling lower levels of income inequality compared to the other eight regions (Figure 11).

Figure 11. Income inequality comparison between eight regions using the Gini index



On comparisons based on the CV, the graph reveals that Dhaka and Chittagong have the highest CV among the eight regions, signifying pronounced wealth disparities in these areas. Concurrently, Khulna and Sylhet exhibit similar trends in their CV, suggesting a moderate level of income inequality. In contrast, Rangpur has the lowest CV trend, indicating the least income disparity in this city over the past two decades (Figure 12).

Figure 12. Income inequality comparison between eight regions using the coefficient of variance



4. Discussion and Analysis

Compared to the conventional growth pattern, the economy of Bangladesh is truly unique. In the last ten years, the country has experienced rapid economic growth thanks to factors such as a growing population, high exports of ready-made garments, remittances, and overall stability in the macroeconomic environment. These factors are reflected in its rising GDP and reduction in poverty (World Bank, 2022). A rising Gini coefficient, however, shows that this steady development has not coincided with favorable income equality. Table 3 represents the cumulative averages of the Gini coefficient for Bangladesh's 8 major regions. The government has made significant efforts to close the income gap, as shown in Figure 12's marginal decline in the Gini index from 2012 to 2018, which is largely attributable to the implementation of targeted policies. Nonetheless, toward the end of 2020, a series of events, including the onset of the COVID-19 pandemic, rising global inflation, and the conflict in Ukraine, disrupted jobs and limited income

opportunities for lower-income groups, which disproportionately impacted the poor, leading to an increasing Gini index post-2020 (Ahmed, 2022).

Table 3. Bangladesh Regional income inequality ranked from highest to lowest.

Region	**Gini Coefficient**
Dhaka	0.64
Chittagong	0.53
Khulna	0.42
Sylhet	0.41
Rajshahi	0.40
Barisal	0.34
Mymensingh	0.28
Rangpur	0.25

Note: The average of the regional income inequality matches the national average of 0.41.

From Table 3, it is evident that the Gini index varies across regions. Dhaka, the capital city, exhibits the highest level of income inequality, with a Gini coefficient of 0.64, compared to smaller regions like Rangpur, Mymensingh, and Barisal, which have Gini coefficients of 0.25, 0.28, and 0.34, respectively. The notable disparity in income inequality across regions such as Mymensingh, Rangpur, and Dhaka is largely attributed to the pronounced rural-urban dichotomy. This divide stems from a variety of factors, including divergent economic structures, varying levels of urbanization, unequal access to essential services, disparities in employment opportunities, and unique social patterns. The fact that Dhaka is an economic hub, is rapidly urbanizing, and has both high- and low-income residents all contribute to its high Gini coefficient. As an economic center, Dhaka attracts investments, foreign businesses, and skilled labor, leading to wealth concentration among a few affluent individuals. Additionally, Dhaka's rapid

urbanization and large-scale migration from rural to urban areas have made it one of the most populated cities in the world. Approximately 68% of Dhaka's population growth is due to rural-urban migration, amounting to an estimated 50,000 migrants to the city each year (Bangladesh Bureau of Statistics, 2019). This influx places immense pressure on already limited resources. Regions with lower income inequality benefit from the country's unique development model, where financial policies, such as incentives for economic development, favor domestic microfinance and attract foreign direct investments. Compared to places like Dhaka and Chittagong, where a few wealthy people have taken advantage of opportunities in technology and finance, regions with lower income inequality tend to be more homogeneous in terms of employment opportunities and rely primarily on agricultural activities.

4.1 Policy Implications and Resource Allocation

In market-driven economies such as Bangladesh, income disparity often arises from an uneven distribution of assets—a gap that widens progressively in favor of the rich. These assets, such as wealth and income, often encompass the end result of various economic processes, including resource allocation, production, and consumption. The government has implemented measures to address income inequality, employing fiscal strategies that redistribute wealth. This includes a progressive income tax system that imposes higher taxes on wealthier individuals. A part of this revenue is then redirected to assist the poor and vulnerable, improving their access to fundamental services like healthcare, education, and water supply (Bangladesh Bureau of Statistics, 2020). Applications of redistributive fiscal policies have been extremely effective at closing the income

disparity gap in European countries. This is mainly due to their strong social expenditure programs, which focus on the poor.

In Bangladesh, current tax policies, including the progressive income tax, fall short of tackling income inequality. The Bangladesh Bureau of Statistics 2018 report reveals that a significant 67% of tax revenues come from indirect taxes like VAT (value-added tax), which tend to be more burdensome on lower-income individuals since they are applied uniformly across all income levels. Additionally, issues such as tax evasion, accounting for 21%, and various exemptions and loopholes further exacerbate the situation (Centre for Policy Dialogue, 2019).

The interplay between government policymaking and the allocation of resources is crucial and demands careful attention to ensure the effectiveness of these policies. Directing resources to areas that benefit low-income groups, such as healthcare, education, and social safety programs, is vital for reducing inequality. Yet, these initiatives can only succeed if they are adequately funded. This includes investing in educational infrastructure to make it universally accessible and ensuring healthcare facilities are well-equipped and staffed, particularly in rural and underdeveloped regions. However, the implementation of these policies often encounters obstacles like bureaucratic red tape, corruption, and limited resources, leading to a gap between policy design and its execution and to less effective outcomes than intended. Thus, the link between policy implications and resource allocation is critical to addressing income inequality in Bangladesh. Effective and equitable policies, supported by strategic resource allocation, are key to reducing disparities and promoting inclusive growth. Challenges in implementation and governance must be addressed to ensure the successful execution of these policies.

5. Recommendations of Regional Development Policy and Ways Forward

Effective policy design and implementation are crucial for a nation's development and should ideally encompass both sectoral and spatial considerations. Regrettably, Bangladesh's national development strategy largely overlooks the interconnections between its various economic sectors. The planning process often neglects the regional distribution of resources and activities, thereby missing opportunities for balanced growth. To address these shortcomings, the Bangladeshi government has implemented several policies aimed at fostering regional development. These policies include infrastructure development in underprivileged areas to attract private capital, create jobs, and stimulate economic growth; social safety nets to protect vulnerable populations from falling deeper into poverty and provide access to essential services; and education and skill development programs to enhance employability and economic success. Additionally, the government promotes agricultural development and entrepreneurial initiatives in rural areas to reduce rural-urban disparities and combat poverty. Tax incentives are also offered to attract businesses to invest in less developed areas, boosting economic activity and job creation.

To address these challenges, the focus should be on increasing stakeholder participation in: development and planning to better utilize project assistance and alleviate strain on domestic resources; emphasizing private sector-driven development to expand project implementation and include more projects in Public-Private Partnerships (PPPs); investing in connecting remote regions to major cities through improved road networks and other physical infrastructure; closing infrastructure gaps, particularly in energy, ports, roads, and bridges;

prioritizing education and social programs to improve the socioeconomic conditions in impoverished regions; and reallocating budgetary resources to vital sectors like health, education, and agriculture, particularly considering the needs of the underprivileged population. The suggested recommendations are based on the challenges and gaps identified in Sections 2, 4, and 5 of the paper. The analysis highlights the unequal distribution of resources and limited access to development opportunities, favoring wealthier regions and contributing to persistent income inequality. It also emphasizes the need for targeted investments in infrastructure, education, and healthcare to improve socioeconomic conditions in underdeveloped areas.

6. Conclusion

Eliminating income inequality is a top priority for any government, yet Bangladesh faces significant challenges in this regard. Effective policy design and implementation are crucial for national development, ideally incorporating both sectoral and spatial elements. Regrettably, Bangladesh's national development planning largely neglects the interrelationships among its various economic sectors. Moreover, there is scant attention paid to the regional distribution of resources and activities, which are essential for balanced growth. Regional production variations are common and often arise from disparities in natural resources, sectoral connections, and market dynamics. Government intervention becomes vital when such disparities hinder both regional and national prosperity. One way to understand regional disparity is through sectoral linkages that shape an economic system. These linkages can be forward or backward; the former refers to the dependency of one industry on another for inputs, while the latter measures how

industrial sectors rely on the supply of inputs from other sectors. According to Zhang and Felmingham (2002), policymakers can evaluate the spillover effects of stimulating one important sector on other sectors by identifying these linkages. Another important metric is the output multiplier, which helps focus investment on the regional sector with the highest multiplier when the primary aim is to boost national production.

According to studies, cities like Dhaka and Chittagong, which have the highest GDP per capita, also benefit from the highest output multipliers in various sectors. This contrasts sharply with other regions like Rajshahi, Barisal, Sylhet, Rangpur, and Mymensingh, which lag behind. This suggests an inevitable concentration of investment in Dhaka and Chittagong, exacerbating regional disparities. The budget for development is insufficient to effectively address the needs of the nation's underdeveloped regions. While Administrative Ministries and Executing Agencies play a significant role in the Annual Development Program (ADP) implementation, the Planning Commission merely facilitates the process. One urgent need for Bangladesh is proper development planning, especially for its underdeveloped regions. A major obstacle to structuring the nation's development planning framework is the lack of adequate and accessible regional data. Further research is required to provide a clearer picture of the state of regional development planning in Bangladesh.

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