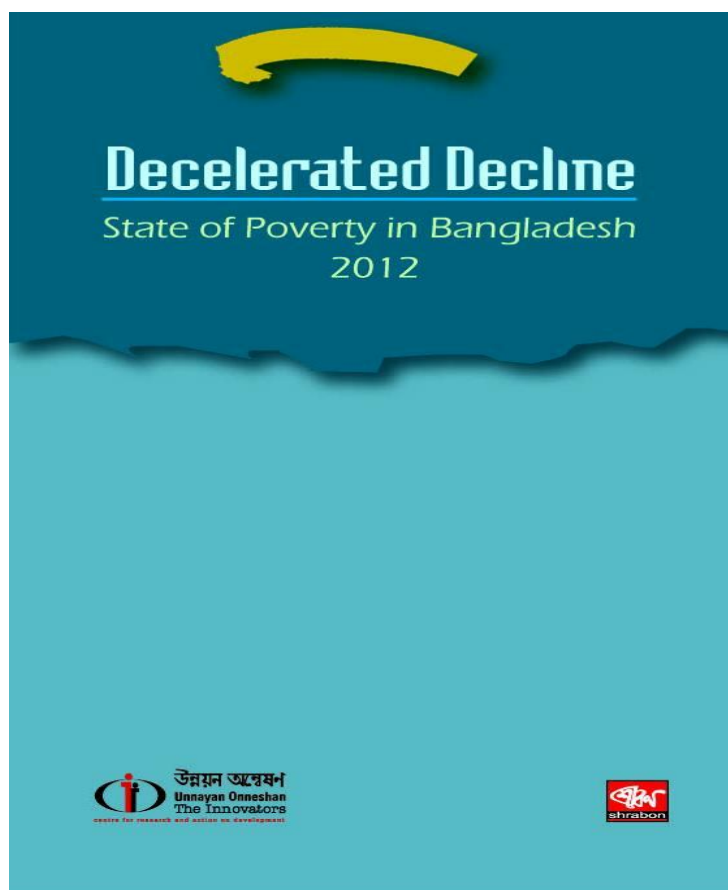


INCIDENCE AND SEVERITY OF POVERTY

K. M. Mustafizur Rahman



This report has been prepared as a chapter for a forthcoming book “Decelerated Decline: State of Poverty in Bangladesh 2012”, edited by Rashed Al Mahmud Titumir to be published by Shrabon Prokashani, Dhaka in October 2012



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INCIDENCE AND SEVERITY OF POVERTY

K. M. Mustafizur Rahman

1 INTRODUCTION

The incidence of poverty in Bangladesh is one of the highest in the world. Millions of people here are suffering from the imprecation of poverty. Bangladesh has been stereotyped as the archetypical theatre of poverty and it was a subject of interest during the British colonial period (Jack, 1976; Siddqui, 1982). After that, it began to attract the attention of researchers after the famine of 1974 and the decade saw a number of studies mainly devoted in counting up the poor (Islam, 2010). Reduction of poverty is a fundamental challenge for Bangladesh. Although, Bangladesh has gained important achievements in fighting against poverty since the early 1990s but there is no room for complacency is there. The incidence of poverty in Bangladesh is one of the highest in the world. Millions of people are suffering from the hardship of poverty on the occasion (Titumir and Rahman, 2011). About one-third (31.5 percent) of its population is still living below the so-called poverty line (BBS, 2010). In this context, likewise many other countries, poverty is still a vital concern and challenge as well for Bangladesh.

Prioritising these, the Millennium Development Goals (MDGs) represent an international commitment to eradicate extreme poverty and hunger and foster global collaboration for development by 2015, while Vision-2021 represents the commitments of the present government to reduce the rate of poverty at 25 percent and 15 percent by 2013 and 2021 respectively. These deadlines are looming and, soon it will be known whether these commitments have been achieved or not. The progress of poverty reduction in Bangladesh requires an in-depth assessment. In this connection, this chapter is an attempt to sketch the current scenario and to make future projection of poverty so that a clear image to generate evidence as well as insights is there that can be used to feed into poverty reduction.

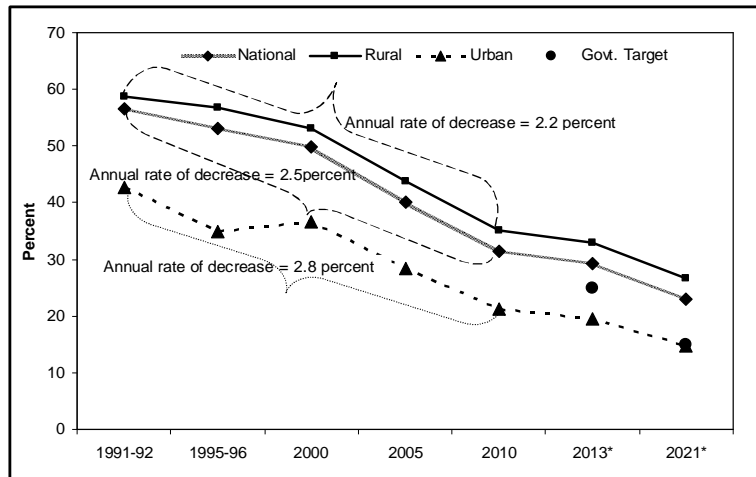
2 CURRENT SITUATION AND FUTURE PROJECTION OF POVERTY

Bangladesh has got acceleration in the fight against poverty during the last two decades. The incidence of poverty has dropped down from 56.6 percent in 1991-92 to 31.5 percent in 2010 (Figure 2.1). However, decline in the aggregate poverty in the subsequent period was associated with decline in the urban poverty (Zohir, 2011).

The present government has made a commitment to reduce the rate of poverty at 25 percent and 15 percent by 2013 and 2021 respectively. According to the latest available national statistics on poverty, based on head count rate (CBN) and using upper poverty line, the incidence of poverty decreased at 31.5 percent in 2010 at the national level with an annual decrease rate of 2.46 percent from 1991-92. If this trend of decrease continues, the incidence of poverty might slide down to 29.2 percent and 22.9 percent by 2013 and 2021, which are higher by 4.2 and 7.9 percent respectively than those of the targets of the present government. To achieve the targets within the time limits (i.e. by 2013 and 2021),

reducing the rate of poverty by 2.7 percent in 2013 and 2.5 percent in 2021 from 1991-92 is required. In the rural areas, the incidence of poverty has decreased from 58.7 percent in 1991-92 to 35.2 percent in 2010 with an annual decrease rate of 2.22 percent. However, in the urban areas, the incidence of poverty has decreased from 42.7 percent in 1991-92 to 21.3 percent in 2010 with a decrease rate of 2.8 percent per annum. Under the business as scenario, with the current rate of decrease the incidence of poverty might be 32.9 percent and 26.6 percent at the rural level by 2013 and 2021 respectively. On the other hand, it might be 19.5 percent and 14.7 percent respectively in the urban area by the same period.

Figure 1: Current situation and future projection of the incidence of poverty



Source: Author's calculation based on Household Income & Expenditure Survey (1991-92, 1995-96, 2000, 2005 and 2010), Bangladesh Bureau of Statistics, 2012

It is evident that the incidence of poverty is higher in rural areas than that of the urban areas as well as the decrease rate of poverty is also lower in the rural areas than that of the urban areas (Figure 1). This is very much responsible for the rural-urban migration. Such movements are indicative either to general improvements in the division, or outflow of labour, primarily from the poor households to a distant growth centre e.g. Dhaka (Zohir, 2011). More specifically, rural poverty results from lack of assets, limited economic opportunities and poor education and capabilities as well as disadvantages rooted in social and political inequalities (IFAD, 2010). However, decline in aggregate poverty in the subsequent period was associated with decline in the urban poverty¹. The incidence of poverty is decreasing at such a rate which will need more time to achieve the desired targets of the present government made in its election manifesto (Figure 1).

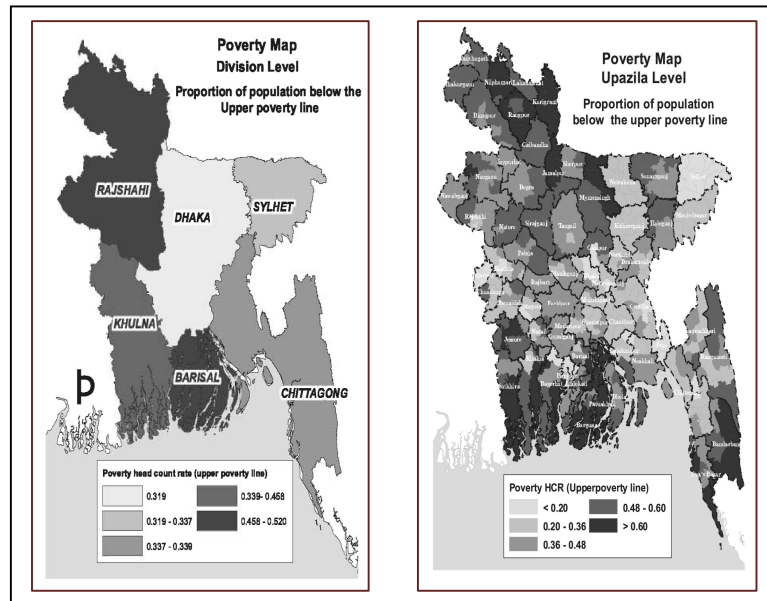
3 INCIDENCE OF POVERTY AT DIVISIONAL LEVEL

There is no denial that geography, culture and politics have been historically intertwined to result in differences across different regions. A great part of spatial differences in

¹ Comparisons with urban poverty lines would reveal further on the segments of the poor who may have moved out; which is not pursued further in the text.

poverty can be attributed to differences in geographical indicators, such as, land use and productivity, infrastructure, electricity, distance to rivers, roads, urban areas (Ravallion and Wodon, 1997). Therefore, a different result is also found in case of the incidence of poverty according to the division. The estimation of head count rates (HCN) by divisions using upper poverty line reveals that the incidence of poverty is higher in Barisal division with 39.4 percent among all other divisions followed by Rajshahi including Rangpur (35.7 percent), Khulna (32.1 percent), Dhaka (30.5 percent) and Sylhet (28.1 percent) (BBS, 2011). However, the incidence of poverty is the lowest in Chittagong division with 26.2 percent. Climate change might be a dominant factor which is responsible for higher incidence of poverty in those areas (Barisal, Khulna and Rajshahi). Whereas the incidence of poverty in Chittagong division is lower than other divisions, which might be occurred due to the business activities centering on natural resources and the seaport.

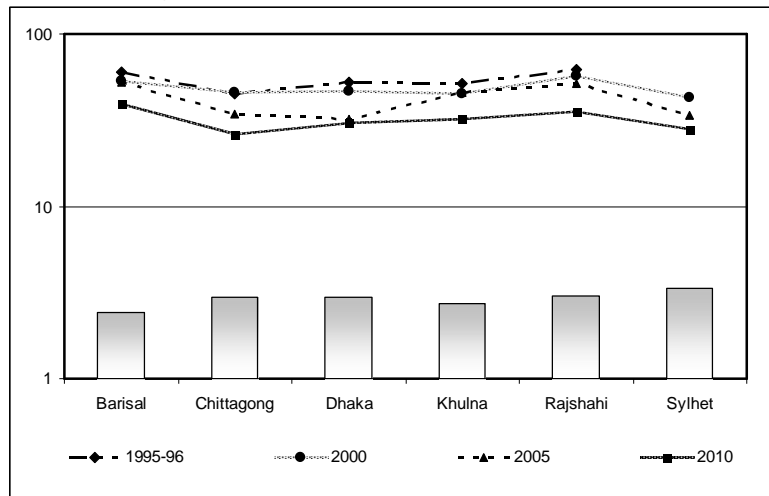
Figure 2: Poverty map of Bangladesh (Division and Upazilla Level)



Source: Adopted from updating poverty maps of Bangladesh, Bangladesh Bureau of Statistics, 2012

The percentage of people living below the poverty line is decreasing in all divisions (Figure 2.3). The annual average rate of reduction in the percentage of population living under the poverty line in Rajshahi division was 3.04 percent between 1995-96 and 2010, which is higher compared to all other divisions. This might be due to increased connectivity, reducing transaction costs and more than national average transfer of cash or kind to population, afflicted by riverbank erosion, 'Monga' (the seasonal poverty). At the same time, this rate was 2.97 percent in Chittagong, 2.95 percent in Dhaka, 2.44 percent in Barisal and 2.71 percent in Khulna division. In case of Sylhet division, the incidence of poverty is decreasing by 3.37 percent per annum from 2000 to 2010.

Figure 3: Incidence of Poverty by Division



Note: The annual rate of decrease for Sylhet is calculated from 2000 to 2010;

Source: Author's calculation based on Household Income & Expenditure Survey (1995-96, 2000, 2005 and 2010), Bangladesh Bureau of Statistics, 2012

4 DEPTH AND SEVERITY OF POVERTY

The poverty gap (PG) estimates the depth of poverty in the population. The head count rates give only the percentage value of poverty incidences, but it does not measure the distance of the poverty prone households from the poverty line whereas the squared poverty gap (SPG) measures the severity of poverty. A substantial fall in poverty gap and squared poverty gap indicates the improvement of consumption of those who are living below the poverty line (upper). A drop in the poverty gap measurement indicates that the average distant of the poor from the poverty line has fallen and a decline in squared poverty gap indicates that the distribution of consumption among the poor has become more equitable. Moreover, these improvements have occurred at the similar rate not only at national level but also at rural and urban poor populations. The poverty gap was 14.4 percent in 1995-96, which decreased to 12.8 percent and 9.0 percent in 2000 and 2005 respectively as well as decreased further to 6.5 percent by 2010. The rate of decrease in the percentage of poverty gap during 2005 to 2010 was lower than that of 2000 to 2005 at national level. This rate was 5.94 percent between 2000 and 2005 whereas it was 5.56 percent between 2005 and 2010. Similar results have been also found in case of the squared poverty gap, which was 5.9 percent in 1995-96 and decreased to 4.6 percent, 2.9 percent and 2.0 percent by 2000, 2005 and 2010 respectively. The rate of reduction in the percentage of squared poverty gap between 2000 and 2005 was 7.39 percent, which was higher than the rate of reduction (6.26 percent) of last five years (i.e. from 2005 to 2010) at national level.

In rural areas, poverty gap was estimated at 7.4 percent in 2010, which was 9.8 percent, 13.7 percent and 15.4 percent in 2005, 2000 and 1995-96 respectively. Here, the rate of reduction (4.9 percent) during the last five years (i.e. from 2005 to 2010) has been found lower than that of the rate (5.7 percent) between 2000 and 2005. The severity of poverty in the rural area has decreased from 5.7 percent in 1995-96 to 2.2 percent in 2010. Additionally, the rate of reduction in the squared poverty gap during 2005 to 2010 (5.81

percent) was found lower than that of the rate between 2000 and 2005 (7.35 percent). On the other hand, a different scenario is found in the urban areas compared to the rural and national level (Table 1), where the rate of reduction in the percentage of both poverty gap and squared poverty gap have occurred at more accelerating pace between 2005 and 2010 than that of the rate between 2000 and 2005. The poverty gap in the urban area was 9.2 percent in 1995-96 has reduced to 4.3 percent in 2010, whereas, the squared poverty gap has reduced from 3.4 percent in 1995-96 to 1.3 percent in 2010. This has been reflected in the incidence of poverty, which is lower in the urban areas compared to the rural and national level. More specifically, the locations of urban areas are initially considered as growth center in respective regions and the growth centre outside the country may influence the dynamics of regional differences within the country (Shilpi, 2007).

Table 1: Depth and Severity of Poverty in Bangladesh

Year	National			
	Poverty Gap (Percent)	Rate of Decrease (Percent)	Squared Poverty Gap (Percent)	Rate of Decrease (Percent)
1995-96	14.4	-	5.9	-
2000	12.8	2.78	4.6	5.51
2005	9.0	5.94	2.9	7.39
2010	6.5	5.56	2.0	6.21
Rural				
1995-96	15.4	-	5.7	-
2000	13.7	2.76	4.9	3.51
2005	9.8	5.69	3.1	7.35
2010	7.4	4.90	2.2	5.81
Urban				
1995-96	9.2	-	3.4	-
2000	9.1	0.27	3.3	0.74
2005	6.5	5.71	2.1	7.27
2010	4.3	6.77	1.3	7.62

Source: Author's calculation based on Household Income & Expenditure Survey (1995-96, 2000, 2005 and 2010), Bangladesh Bureau of Statistics, 2012

5 DIVISIONAL DISPARITY OF DEPTH AND SEVERITY OF POVERTY

Like incidence of poverty, the depth and severity of poverty also varies at divisional level. However, a decrease in the percentage related to depth and severity of poverty is there whereas, in most of the cases, the recent decrease has occurred at a slower rate than the previous years (Table 2). The depth of poverty, measured by the poverty gap has decreased from 18.0 percent in 1995-96 to 9.7 percent in 2010 in Barisal division. However, there is an increase in the percentage of poverty gap in 2005 compared to 2000 what is found decreasing after that. Although the percentage of poverty gap in Chittagong division has increased in 2000 compared to 1995-96 what was decreasing later on. However, the rate is much slower than the previous one. In case of Dhaka division, the poverty gap is gradually decreasing with the advancement of time but the rate of reduction in the last five year (2005 to 2010) is much slower than the previous five years (2000 to 2005). The poverty gap is also decreasing with the advancement of time except 2005 for Khulna division. The poverty gap is found as decreasing for both Rajshahi and Sylhet division over the years and the reduction has occurred with a more accelerated pace than the previous.

The severity of poverty as measured by the squared poverty gap is also decreasing over the years in all divisions. It is found that the severity of poverty is decreasing in the last five years (2005 to 2010) with a slower rate than that of the previous five years (2000 to 2005) for Chittagong and Dhaka division whereas, it rate was decreasing for Barisal, Khulna, Rajshahi, and Sylhet divisions with a much accelerated pace than the last five years.

Table 2: Depth and severity of poverty by division

Division	1995-96	2000	2005	2010
	Poverty Gap (Percent)			
Barisal	18.0	13.7	15.5	9.7
Rate of Decrease (%)	-	5.9	(+) 2.6	7.5
Chittagong	10.5	11.3	6.3	5.1
Rate of Decrease (%)	-	(+) 1.9	8.8	3.8
Dhaka	14.9	12.9	6.9	6.2
Rate of Decrease (%)	-	3.4	9.3	2.0
Khulna	12.4	10.0	10.8	6.4
Rate of Decrease (%)	-	4.8	(+) 1.6	8.1
Rajshahi	17.9	16.2	11.9	6.1
Rate of Decrease (%)	-	2.4	5.3	9.7
Sylhet	NA	9.2	7.2	4.7
Rate of Decrease (%)	-	-	4.3	6.9
Division	Squared Poverty Gap (Percent)			
Barisal	7.1	4.7	6.3	3.4
Rate of Decrease (%)	-	8.5	(+) 6.8	9.2
Chittagong	3.4	3.9	1.7	1.5
Rate of Decrease (%)	-	(+) 3.7	11.3	2.4
Dhaka	5.8	4.7	2.1	1.8
Rate of Decrease (%)	-	4.7	11.1	2.9
Khulna	4.3	3.0	3.5	2.0
Rate of Decrease (%)	-	7.6	(+) 3.3	8.6
Rajshahi	7.0	6.2	3.8	1.8
Rate of Decrease (%)	-	2.9	7.7	10.5
Sylhet	NA	2.8	2.1	1.3
Rate of Decrease (%)	-	-	5.0	12.4

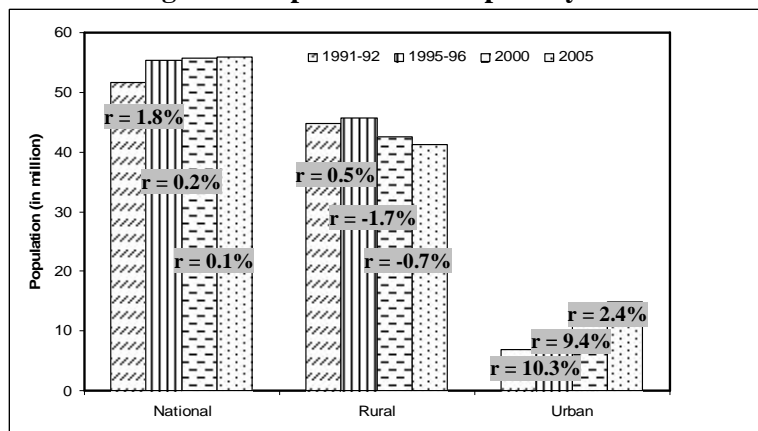
Source: Author's calculation based on Household Income & Expenditure Survey (1995-96, 2000, 2005 and 2010), Bangladesh Bureau of Statistics, 2012

6 POPULATION UNDER POVERTY LINE

The number of people living below the poverty line is still increasing, however, a progress in reducing the overall incidence of poverty is there during the last two decades. Soaring food price and food inflation, climate change as well as the lack of balanced development throughout the country are attributed to such increase. The number of population living below the poverty line has increased from 51.6 million in 1991-92 to 56 million in 2005 with an annual average rate of 0.314 percent at national level. Furthermore, it is also observed that the annual rate of increase in the percentage of population under poverty line is increasing with a slower rate than that of the previous years (Figure 4). The annual rate of increase was 1.8 percent during 1991-92 to 1995-96 which was 0.2 percent and 0.1 percent during 1995-96 to 2000 and 2000 to 2005 respectively.

This number has decreased from 44.8 million to 41.2 million in the rural areas during 1991-92 to 2005 with an average decrease rate of 0.26 percent per annum. Additionally, it is also found that this number has increased from 44.8 million to 45.7 million during 1991-92 to 1995-96 with an annual increase rate of 0.5 percent and later on, it started to decline. The annual rate of decrease in the percentage of population under the poverty line was 1.7 percent and 0.7 percent during 1995-96 to 2000 and 2000 to 2005 respectively. A different scenario was found in case of the urban area where the number of population under the poverty line has increased from 6.8 million in 1991-92 to 14.8 million in 2005 along with the average increase rate of 0.57 percent per year. Although an increasing trend in the percentage of population living below the poverty line is there, such increase has occurred at a slower pace than before (Figure 4). An interesting finding here is that the number of population under poverty line is decreasing in the rural area whereas an increasing trend is there in the urban area. The rural-urban migration might be the resultant for such rate on this occasion.

Figure 4: Population under poverty Line



Source: Author's calculation based on Household Income & Expenditure Survey (1995-96, 2000, 2005 and 2010), Bangladesh Bureau of Statistics, 2012

7 QUESTIONING THE POVERTY LINE

There is no denying the fact that poverty measurement is plagued with many problems particularly, due to its over emphasis on income. The official poverty measurement is determined through income and used an unrealistically low estimate of USD 1.25. For example, if a person has an income of USD 1 per day s/he is defined as poor. After one year, if his/her income increases to USD 1.3 s/he will be counted as non-poor. Nonetheless, in reality, s/he may face with more problems to maintain his/her livelihood compared to the previous year (though s/he is considered as non-poor). In this context, increase in his income is not adjusted with the inflation. Furthermore, considering the present circumstances, a conservative estimation suggests a minimum spending of about Tk. 50 (USD 0.71) to obtain 2122 kcal per day. That person also needs non-food essentials including education, clothing, healthcare, accommodation, transportation etc. If a calculation is made based upon expenditure, it is very difficult to survive with the income of USD 1.25 per day per person considering these non-food essentials with food. Recently, according to a renowned Economist of the country, Abul Barakat, a

contradiction is arisen about the number of poor people in the country as 83 percent negating the 32 percent as the government claims (The Daily Star, 9 October 2011). Furthermore, higher rate of growth in household expenditure than that of the income may indicate that more people are suffering to manage their livelihood in the recent time (Titumir and Rahman, 2011). Therefore, many households might be added to the poverty line. In this situation, it is high time to take consumption cost (considering inflation) while measuring poverty.

8 WHY POVERTY IS REDUCING AT A SLOWER RATE?

The government has taken several initiatives for alleviating poverty, yet the poverty persists. This is mainly due to the problems associated with the neo-liberal paradigm that the successive governments are pursuing in reducing poverty including those of the poverty reduction strategies (PRS).

Different problems will be arisen if people fail to conceptualise that the poverty is the manifestation of social property relationship. The rate of decline in poverty is being accelerated or decelerated depending upon the social property relations. In this regard, the neo-liberal articulation, an increase in the size of the “things-basket” reduces poverty is not considerable as much. This happens as this “things-basket” is being operated under particular social relationships. The “things-basket” may reduce poverty up to a certain point, but mainly it could be reproduced due to social property relationship, embedded through institutions, structures, power and reality as well as composition of the state.

In instrumental sense, the major reasons for persistence of poverty are: absence of adequate state intervention for the expansion of production, deficiency of equalising income augmenting employment system, shortfalls in public expenditure for enhancements of capabilities, inadequacies in regulatory regimes, lack of complementary policy structure and zero existence of enforceability of constitutional rights.

Social Relationship

Poverty is a part of social relationship. The poor are remaining as they are due to the structural reasons. Even reduction in income poverty has a limit, as it is contingent upon the structure. For example, one may generate income at an increased rate but ought to remain at the same level inside the society due to the social stratification. People belonging to the lower class of the society are not allowed to be associated with the upper class anyway. Hence, even if income poverty scenario changes somehow, social poverty remains unchanged due the structural reasons. Moreover, reduction in income poverty has a limit, as it is reliant to the structure. The social structure reproduces poverty.

Intervention of State in Enhancing Productive Capacity

The neo-liberal paradigm reduces the capacity of state through liberalisation, deregulation and privatisation assuming that the market will deliver the results. This further assumes that a part of the population will plunge into the poverty and they will be addressed through social safety nets. The failing of the paradigm means the failing to take cognisance of the endemic market failures and the need for the state to intervene with strategies, policies and incentives to enhance the productive capacity for ensuring full

employment particularly, addressing the disguised unemployment. Lack of work of the people means lack of money that suggests high unemployment leading towards high level of poverty.

Deficiency of Equalizing Income Augmenting Employment System

The growth process in Bangladesh has not been accelerating with the increase of job opportunity. Moreover, the people having entered into labour market with poor wages are only creating a huge amount of people termed as “working poor.” Furthermore, a huge chunk of employed population is under-employed. These have also resulted in augmentation of income inequality. However, typical incomes and adjustment of inflation grew little while the cost of living is increasing randomly making the livelihood of the people more struggling and hard as well. In this situation, only full time employment is an essential way of achieving the sustainable livelihood which in turn, is a crucial means of reducing poverty.

Shortfalls in Public Expenditure for Capabilities Enhancements

The public expenditure in capabilities has always been found less than the required level. This is particularly worsened when the budget deficit soars up. The public expenditure in education, health and housing has an impact on the poverty. Though Tk. 86,891 crore (53.12 percent of total budget) is proposed as poverty reducing expenditure in the FY 2011-12 (3.55 percent less than that of the revised budget of the previous FY 2010-11). The government has allocated 13.79 percent of the total budget and 2.51 percent of GDP in social safety net programmes (SSNP). This is, however, is not adequate considering the magnitude of the problems.

Inadequacies in Regulatory Regimes

The system of accumulation in Bangladesh is principally primitive in nature. Such accumulation is omnipresent, particularly in cases of accessing as well as controlling over natural resources, common property resources, and subsidies of state resources. The biasness created in favour of rich and powerful could be somehow lessened by giving the poor access to such resources by the regulatory regimes. Absence of dynamic regulatory policies and enforcement reduces the poor’s access to the existing resources and hence, poverty is reproduced or graduation becomes difficult.

Policy Incoherence and Lack of Complementation

Poverty may also increase due to the lack of maintaining coherence and/or complementation in policies and implementation. For example, the tax system of the country is regressive and bias in favour of rich as the government continues to broaden the purview of across the income quintiles equal incidence bearing tax like value added tax (VAT) while there is hardly any concerted efforts in increasing income tax net and reduction in tax evasion as well as avoidance of corporate houses. While the inflation is cropping up, no adequate policies are there to equalize the income erosion of the poor.

Ensuring Constitutional Obligation

The constitution of the country pledges to ensure basic necessities to its citizens by the state. Since these rights are not legally enforceable, the state as a duty bearer to the rights

holders could not be operated. Therefore, difficulties for the poor people to enjoy the basic necessities and get rid of poverty exist in the long term.

Expanding Population, Failing to Harness Population Dividend

Excessive high population density is a stress on available resources. However, the bulkiness of the population of working age provides an ample opportunity to harness population dividend. The country's successive plans have not put people as the centre and employment at its heart. Therefore, additional population without opportunities only adds number rather than being asset to the existing people living under poverty.

Environmental Degradation and Climate Change

Environmental degradation as like the deterioration of the natural environment including the atmosphere, bodies of water, soil, and forests plays a problematic role in accelerating poverty. Environmental disturbances led people to the shortages of food, clean water, materials for shelter, and other essential resources. As a result, the country has been further exacerbated being one of the worst victims of climate change in the world.

9 CONCLUSION

Alleviating poverty and meeting up basic needs are the primary goals of the government. Nevertheless, achieving this goal is a fundamental challenge for the country without which the human development, economic and employment goals of the government may be hindered. Despite considerable trust on poverty alleviation in all planned documents since the independence of Bangladesh, a significant number of people are still living below the poverty line. It is constitutional obligation of the government to provide a decent living standard for the citizens by alleviating poverty. However, like many other countries, poverty in Bangladesh is still a serious concern. Although the present government of Bangladesh is very much hopeful in achieving the target of Millennium Development Goals (MDGs) as well as the targets of Vision-2021 related to poverty and inequality. This report shows that Bangladesh is not well on the track in achieving those targets as well as the percentage rate of reduction in poverty is slowing down compared to the previous year. Moreover, it might be quite difficult to achieve the targets, unless the top priorities are being given by the government on the issues outlined above.

Tackling structural barriers is important. For example, market failures, unresponsive public services or prejudice and discrimination are the hindrances for the people to access in opportunities available to others. Most of the initiatives taken by the government are short-term basis which might never be a sustainable solution in reducing poverty. While household income is seen importantly in policy documents, programmatic intervention is inadequate. Unless the reformation of land, agrarian and aquarian are being implemented and rapid industrialization is being promoted, only a few income promotions as well as safety net programmes will not enough to increase household incomes and reduce vulnerability.

Theoretically, some of the strategic documents and policy papers are seemed to be implementable. However, without proper monitoring and evaluation, the implementation

of all these policies, strategies and programmes seems like mere window dressing. The government needs to be creative in renewing and revising strategies and approaches to control the rising food prices. Moreover, food inflation as well as increase in budgetary allocation for poverty alleviation should be implemented. Therefore, provisions must be formulated for the evaluation of programmes and understanding the impacts as well. Findings need to be scientifically utilised in developing suitable programmes addressing in the case of reducing poverty and inequality in Bangladesh. Otherwise, the aim of reducing poverty and inequality may remain as an elusive and distant dream which is never been expected from the nation.

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Appendix A

Table: Poverty trend

Year	International Standard		National Standard	
	<i>People living on less than USD 1.25 a day</i>		<i>People living below national poverty line</i>	
	Millions of Poor	Poverty Headcount Ratio (Percentage)	Millions of Poor	Poverty Headcount Ratio (Percentage)
1992	75.7	70.2	62.4	56.6
1996	71.6	60.9	60.1	50.1
2000	75.9	58.6	63.4	48.9
2005	71	50.5	56.2	40
2010	64.3	43.3	46.9	31.5

Source: Poverty & Equity Data, The World Bank, 2012

Mathematical Equation

$$P_l = P_b (1 + ry)$$

$$\Rightarrow r = \frac{1}{y} \left(\frac{P_l}{P_b} - 1 \right)$$

Where,

P_l = Value of the launch year;

P_b = Value of the base year;

y = Number of years between launch year and base year;

r = Rate of growth

Then, a projection using this method could be computed as:

$$P_t = P_l (1 + rz)$$

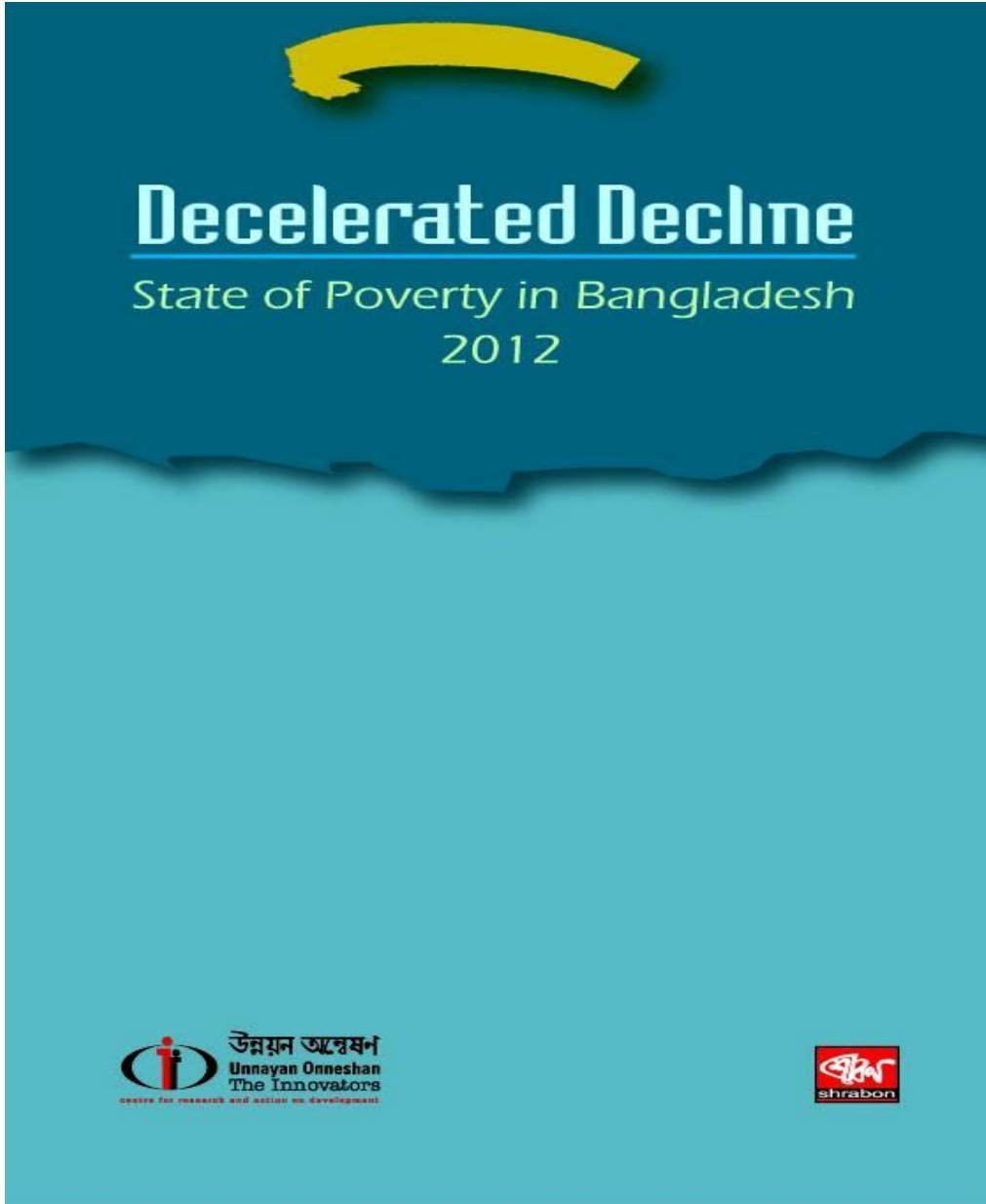
Where,

P_t = Value of the target year;

P_l = Value of the launch year;

z = Number of years between target year and launch year;

r = Rate of growth



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