

**DRAFT**

# **Trends and Patterns of Poverty in Bangladesh in Recent Years**

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\* We would like to thank Aphichoke Kotikula for the district level maps

1. Bangladesh has been successful in achieving significant poverty reduction since 1990, as successive rounds of Household Income and Expenditure Surveys (HIES) conducted by the Bangladesh Bureau of Statistics (BBS) have shown. This paper will focus particularly on changes in poverty incidence during the period of 2000-2005 – between the last two rounds of the HIES – disaggregated by rural/urban areas and divisions. The relationship between changes in poverty, consumption growth and distributional changes is also explored in some detail. The analysis will help better understand the pattern of poverty reduction in Bangladesh – between different consumption groups, urban and rural areas and regions.

2. Section I below presents the poverty trends in Bangladesh, including poverty headcount and other measures at the national, rural and urban levels, how these relate to growth and distributional changes, and how they compare with the experiences of other developing countries. Section II focuses on the regional pattern of poverty reduction – how the regional differences compare between 2000 and 2005, whether certain parts of the country can be identified as lagging behind the rest of the country in poverty reduction, and how these patterns are in turn linked to growth and inequality changes in specific regions. Section III focuses on the question that given the relationship between poverty reduction, inequality and growth seen during the last 15 years, what are the projected poverty trends under different GDP growth scenarios for Bangladesh, and how likely the country is to achieve the MDG target of halving poverty rate from the 1991 level by the year 2015. These projections are arrived at using estimates for elasticity of poverty reduction to growth, with appropriate caveats qualifying the results.

### **I. Recent poverty trends in Bangladesh**

3. Sizeable poverty reduction occurred in Bangladesh between 2000 and 2005, as well as over the longer 15-year time horizon of 1991-2005. Poverty headcount rates based on both upper and lower poverty lines using the Cost of Basic Needs (CBN) method show that the proportion of poor in the population declined considerably between 2000 and 2005. Trends in other measures of poverty indicate that the improvements were not limited to reductions in the size of the poor population relative to the total population, but also in the level and distribution of consumption *among* the poor. The improvements also occurred at similar rates for urban and rural areas. Furthermore, the extent of poverty reduction in Bangladesh between 2000 and 2005 was on par or higher than what was seen in other countries in South Asia during similar periods. This was partly due to GDP growth rates that compared well with the region, as well as no appreciable increase in consumption inequality during this period.

#### **Poverty estimates – national, rural and urban**

4. **The proportion of population below the upper poverty line declined by 18 percent between 2000 and 2005.** In the year 2005, 40 percent of Bangladesh’s population was poor (per capita consumption below the *upper poverty line*) as compared to 49 percent in 2000 (Table 1). The percentage decline in poverty rate was higher in urban areas (24 percent) than rural areas (19 percent). The reductions were statistically significant – at 95 percent level of confidence for national and rural poverty, and at 90 percent level for urban poverty (see Annex, Figure A-1.1).

	<i>Upper Poverty Lines</i>		<i>Lower Poverty Lines</i>	
	<i>2000</i>	<i>2005</i>	<i>2000</i>	<i>2005</i>
National	48.9	40.0	34.3	25.1
Urban	35.2	28.4	19.9	14.6
Rural	52.3	43.8	37.9	28.6

*Source:* HIES 2000 and 2005; using poverty lines estimated with HIES (2005) and deflated to adjust for inflation during 2000-05  
*Note:* These figures are using BBS’s adopted method of using the 2005 sampling frame to generate poverty lines and then deflating these lines to obtain poverty figures for earlier years.

5. **The percentage of population under the lower poverty line, which can be interpreted as the threshold for extreme poverty, declined by 27 percent.** 25 percent of the population was extremely poor (per capita consumption below the lower poverty line) in 2005 as compared to 34 percent in 2000. Extreme poverty rate declined by 27 percent in urban areas and 25 percent in rural areas. It is worth noting that the percentage decline in extreme poverty rate was more than that in the poverty rate, which in turn is consistent with the growth in per capita consumption for the bottom two deciles being higher than that for the 3<sup>rd</sup> and 4<sup>th</sup> deciles (see Figure 4 below).

6. These estimates are based on poverty lines developed by the Bangladesh Bureau of Statistics (BBS) jointly with World Bank staff, based on a methodology that involves estimating the poverty lines using HIES 2005 data, using a Cost of Basic Needs (CBN) approach similar to what had been used for the previous poverty line developed using HIES 1991-92. Poverty estimates for previous years are obtained by deflating the 2005 poverty lines by appropriate prices indices. Estimates using alternative methodologies, which serve as important “sensitivity” checks for poverty trends, reveal that similar trends are obtained for a wide range of methods for estimating and updating poverty lines (for a brief description of the methodology underlying the poverty line and price adjustments, see Annex, Section 1).<sup>1</sup>

7. **The fall in poverty headcount rates is large enough to significantly reduce the number of people in poverty or extreme poverty.** The size of the population below the upper poverty and the lower poverty line has declined by nearly 6 million and 8.3 million respectively. In spite of these reductions however, around 56 million Bangladeshis are still below the (upper) poverty line, 35 million among whom are below the lower or extreme poverty line level (see Annex, Table A-1.1)<sup>2</sup>.

8. **Depth and severity of poverty showed similar improvements.** Table 2 shows that both depth and severity of poverty (with respect to the upper poverty line) have fallen significantly nationally (by 30 and 37 percent respectively). The percentage decline in depth and severity are similar for urban and rural areas, unlike what is seen for poverty headcount. Depth (measured by poverty gap) declined by 28 and 29 percent and severity (measured by squared poverty gap) by 36 and 37 percent for urban and rural areas respectively.

	<i>Poverty gap</i>		<i>Squared poverty gap</i>	
	2000	2005	2000	2005
National	12.8	9.0	4.6	2.9
Urban	9.0	6.5	3.3	2.1
Rural	13.7	9.8	4.9	3.1

*Source:* HIES 2000 and 2005; using poverty lines estimated with HIES (2005) and deflated to adjust for inflation during 2000-05

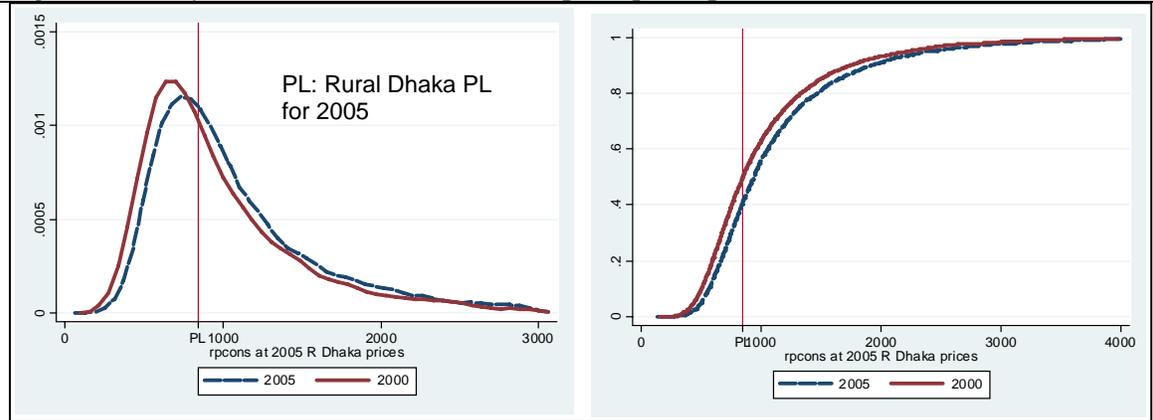
9. The substantial fall in poverty gap and squared poverty gap indicates that consumption of those below the (upper) poverty line improved considerably. A fall in the poverty gap measure indicates that the average “distance” of the poor from the poverty line has fallen; a decline in squared poverty gap indicates that the *distribution* of consumption among the poor has become more equitable. Moreover, these improvements have occurred at similar rates for the urban and rural poor populations.

<sup>1</sup> These poverty estimates have been made public by the government through the release of the Preliminary HIES 2005 Report by BBS in October 2006. The poverty Annex of this Report, produced jointly by BBS and Bank staff, lays out the methodology underpinning these estimates in some detail

<sup>2</sup> These numbers should however be considered rough estimates, since they are based on estimates using population weights from the HIES data and subject to potential sampling and non-sampling errors.

10. **Rural-urban gap in poverty rate is significant.** While the rural-urban gap has closed slightly between 2000 and 2005, the gap still remains considerable. Rural poverty rate in 2005 was 44 percent, compared to an urban poverty rate of 28 percent. Rural areas account for 75 percent of the total population of Bangladesh, but 82 percent of the poor population.

**Figure 1: Density and cumulative distribution of per capita expenditure (2000 and 2005)**



Source: HIES (2000 and 2005)

Note: The poverty rate is given by the vertical coordinate (Y-axis) of the point where the cumulative distribution functions intersect the poverty line.

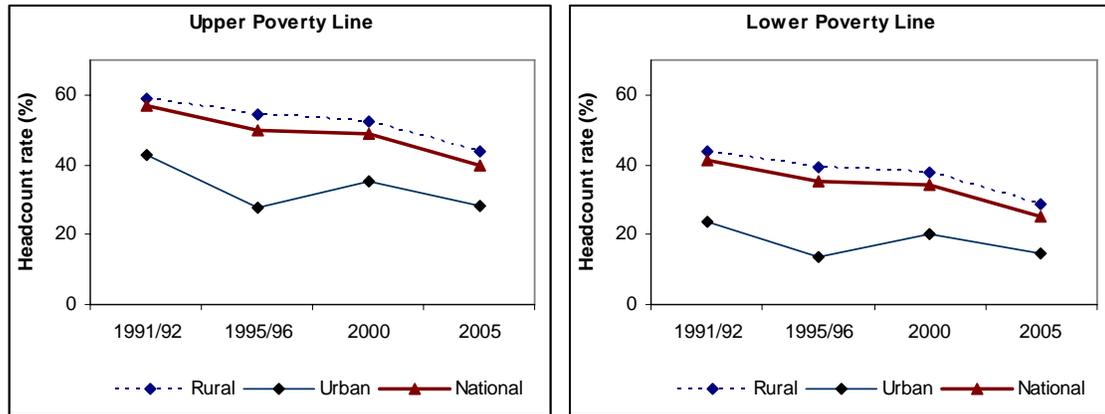
11. **The reduction in poverty headcount is robust to a wide range of choices for poverty lines.** Similar reductions in national poverty rate (8-9 percentage points) are found using a number of different methods to calculate poverty lines and price indices, indicating that the reduction in poverty is not dependent on the choice of a particular method. This can also be seen clearly from Figure 1, which shows the changes in the distribution of per capita consumption expenditure between 2000 and 2005.

12. The density curves in Figure 1 show that the distribution of per capita expenditures has shifted slightly downward and to the right, which is consistent with a rise in consumption (in real terms) for the entire population. The cumulative distribution curves indicate the same phenomenon, and also show clearly that for a wide range of values for the poverty line, the reduction in poverty rate between 2000 and 2005 is significant and almost unchanged. These facts are also consistent with the trends in average consumption and inequality measures discussed in the next sub-section.<sup>3</sup>

13. **Longer-term trends are useful to see the extent of fall in poverty over the last 15 years, as well as how the changes during 2000-2005 compare with earlier periods.** Figure 2 shows that significant decline in poverty occurred from 1991-92 to 2005 – using both upper and lower poverty line. National poverty headcount using the upper poverty line declined from 57 percent in 1991-92 to 40 percent in 2005, while extreme poverty rate (using the lower poverty line) declined from 41 to 25 percent over the same period (see Annex, Table A-1.2). Among the three interim periods, the highest reduction in poverty occurred during the period 2000-2005. Other measures of poverty, such as poverty gap and squared poverty gap show long-term trends similar to those for headcount rates.

<sup>3</sup> The cumulative distribution of per capita consumption expenditures drawn separately for urban and rural areas show that the estimated change in urban poverty is more sensitive to the placement of the poverty line than that in rural poverty (see Annex 1, Figure A-1.2).

**Figure 2: Long-term poverty trends (headcount rates)**



Source: HIES (different rounds)

Note: Headcount rates calculated using the Upper and Lower Poverty Lines of 2005, adjusted for price changes between years.

14. While rural and urban areas experienced similar reduction in poverty rates between 1991-92 and 2005 (both reduced by 15 percentage points using the upper poverty line), the pattern of decline was quite different for the two areas in the interim periods. **The period of 1991-92 to 1995-96 saw the most rapid decline in urban poverty, while the largest decline in rural poverty occurred during 2000-2005.** Urban poverty declined sharply (from 43 to 28 percent using the upper poverty line) from 1991-92 to 1995-96, increased in 2000 and fell back to the 1995-96 level in 2005. The decline of rural poverty was slower than that of urban poverty between 1991-92 to 1995-96, even slower between 1995-96 and 2000, and rapid between 2000 and 2005.

### Consumption growth and distributional changes

15. **The rapid decline in poverty during 2000-05 was driven by sizeable growth in per capita consumption expenditure.** Per capita consumption expenditure from HIES increased by 12 percent in real terms between 2000 and 2005 – an average annual growth rate of 2.3 percent (Table 3). While the increase in percentage terms was higher for rural areas (12 percent) than urban areas (5 percent), real per capita expenditure in 2005 was still 39 percent higher for urban areas than for rural areas.

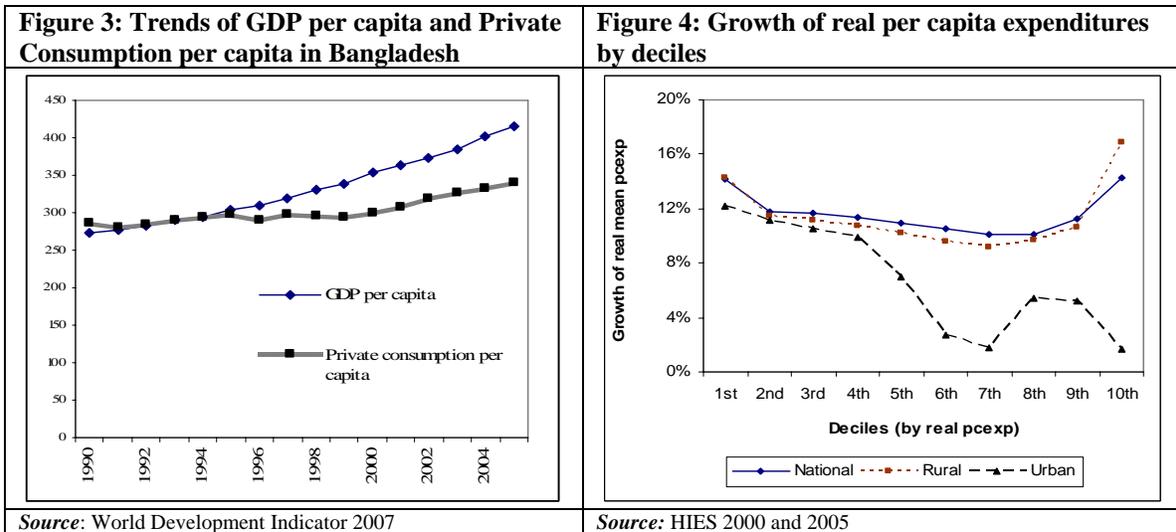
	2000	2005	Cumulative change (%)	Average annual growth (%)
National	1082	1210	11.9	2.3%
Rural	985	1103	12.0	2.3%
Urban	1465	1535	4.8	0.9%

Source: HIES 2000 and 2005  
 Note: To obtain real consumption, nominal consumption expenditures are deflated by price indices to adjust for inflation over time and by upper poverty lines to adjust for regional price differences.

16. The estimates of consumption growth from HIES are also broadly consistent with Bangladesh's macroeconomic performance during the period 2000-05. Annual average growth in real GDP per capita was 3.3 percent and that of private consumption per capita (a component of GDP) was 2.8 percent. The growth in private consumption component was also higher during 2000-05 than any previous period since 1990, which is consistent with 2000-05 being the years of highest poverty reduction (Figure 3).

17. The services sector now accounts for more than 50% of GDP while agriculture has declined from 25 percent to 19 percent between 2000 and 2005. Industry accounted for 26% of GDP in 2005 with the Ready Made Garment sector being the main source of manufacturing growth. A

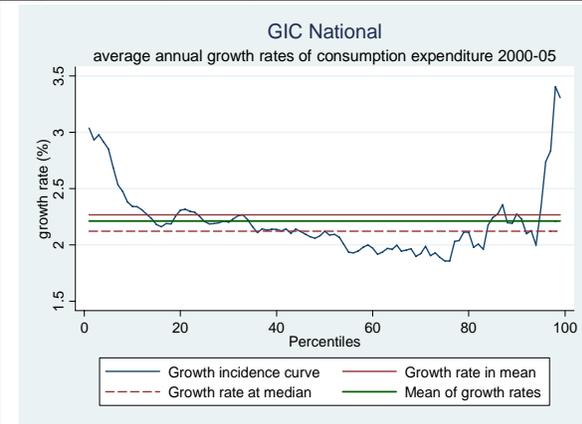
separate background paper for the Bangladesh Poverty Assessment on shifts in the labor market, among other findings, illustrates the importance of the services sector in generating new jobs.



**18. Growth in consumption occurred across the board for the poor and non-poor alike.** Per capita consumption of the poorest and richest population deciles grew by 14 percent in real terms between 2000 and 2005, and that of the second-poorest and second-richest deciles by 12 and 11 percent respectively. Among the rural population, growth in average consumption was highest for the upper and lower ends of the distribution; among the urban population the lower end of the distribution experienced higher consumption growth (Figure 4).

19. How growth was distributed among different consumption groups can be seen in greater detail from *Growth Incidence Curves* (GICs) that indicate the annual average growth of per capita consumption for percentiles of the population. These show that the highest growth in consumption during 2000-2005 occurred for the bottom 20 percent and top 10 percent of the population (Figure 5). Furthermore, growth rate for the bottom 30 percent is higher than the mean of growth rates (of all percentiles). The fact that the mean of growth rates is very close to the growth rate of mean consumption suggests that on the whole, growth in consumption during 2000-2005 was equitable across consumption groups in *percentage or relative* terms.

**Figure 5: Growth Incidence Curve for per capita expenditure (2000-05)**



Consumption groups	Growth rates (%)		
	National	Rural	Urban
Difference between: 1 <sup>st</sup> & 20 <sup>th</sup> pctiles	2.48	2.46	2.24
1 <sup>st</sup> & 30 <sup>th</sup> pctiles	2.40	2.35	2.16
Growth rate of mean	2.27	2.29	0.94
Mean of growth rates*	2.21	2.10	1.38

Source: HIES (2000 and 2005)

\*: mean of annual growth rates of all percentiles

20. A more disaggregated picture reveals that the rural GIC is similar in shape to the national one; whereas the urban GIC is largely downward sloping, which indicates **growth was more pro-poor in urban areas** (see Annex, Figure A-1.4).

This is also apparent from comparing the growth rate of mean consumption with the mean of growth rates separately for urban and rural areas – the former is marginally higher for rural areas, but significantly lower for urban areas.

21. Consistent with the growth trends, relative inequality as measured by the Gini index of per capita real consumption for the country showed no change between 2000 and 2005 (Table 4).<sup>4</sup> The urban gini fell and the rural gini increased over this period, these changes are very small. In fact, since 1995-96, the changes in national and urban/rural Ginis are too small to be statistically significant, which indicates that changes in the distribution (relative to the mean of the distribution) has remained stable for the last decade in Bangladesh.

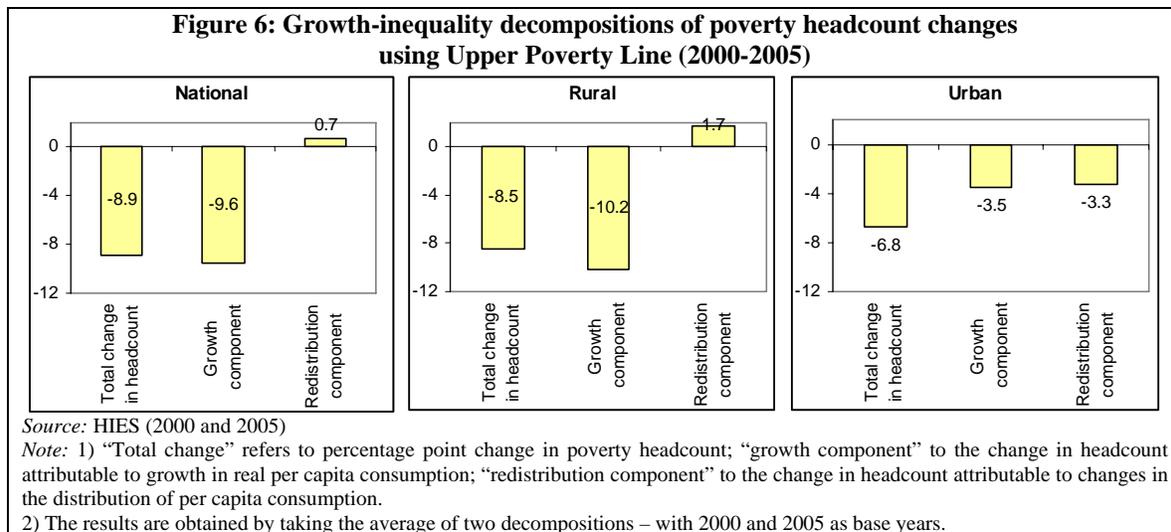
22. Decompositions of changes in poverty measures indicate that the **reduction in national and rural poverty is largely explained by consumption growth**. While the effects of growth and distributional change act in opposite directions nationally and for the rural population, the effect of the latter is almost negligible (Figure 6). For example, for the national population, consumption growth accounted for nearly 10 percentage point reduction in poverty headcount, while change in distribution accounted for less than 1 percentage point increase in headcount. In urban areas on the other hand, growth and redistribution effects act in the same direction and are of similar magnitude.

	1991-92	1995-96	2000	2005
National	0.26	0.31	0.31	0.31
Urban	0.31	0.37	0.37	0.35
Rural	0.25	0.27	0.27	0.28

Source: HIES (different rounds)  
Note: 1) Nominal consumption are adjusted for spatial/regional price differences (deflated by Upper PL) to obtain “real” ginis for each year  
2) Gini index for year *t* is half the ratio of mean absolute deviations (MAD) of per capita exp to the mean of the distribution in year *t*.

<sup>4</sup> See Annex, Figure A-1.3 for Lorenz curves of per capita real expenditures for 2000 and 2005.

23. These results are consistent with the growth and inequality trends described above – growth in national and rural consumption averages has been substantial along with little change in relative inequality, while a lower rate of consumption growth in urban areas has been accompanied by some reduction in relative inequality.



24. **Relative versus absolute inequality.** Notably, the measure of inequality (Gini index of per capita consumption) used so far is *relative*, implying that it remains unchanged if inequality *relative to the mean of the distribution* does not change. Given that growth in consumption occurred at similar rates for all consumption centiles, it is no surprise that the relative inequality measure remained unchanged between 2000 and 2005.

25. In contrast, *absolute* inequality measures the *size of the gap in consumption* between different groups. The difference between relative and absolute Gini indices is illustrated by one example: if everyone's per capita expenditure increased by the same proportion, relative Gini would remain unchanged while the absolute Gini would increase (since the gaps would increase, given an initial distribution that is unequal). Both these measures are important for a full understanding of distributional changes, although each has its pros and cons: while the absolute index is closer to the common man's perception of what inequality is about, the relative index can be more meaningful for comparisons over time when the average levels of consumption can change significantly.

26. **Absolute inequality has increased nationally and for rural Bangladesh between 2000 and 2005, but remained almost unchanged for urban areas.** The absolute Gini index of per capita real consumption increased by 13 percent and 15 percent for the national population and rural population respectively (Table 5).

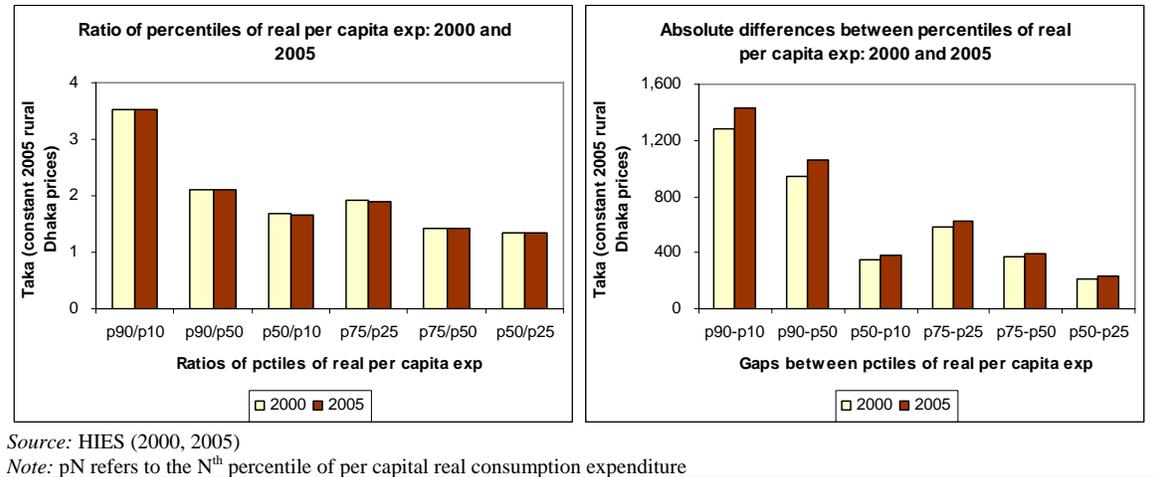
	2000	2005
National	0.31	0.35
Urban	0.37	0.37
Rural	0.27	0.31

Source: HIES (2000, 2005)  
 Note: 1) Nominal consumption are adjusted for spatial/regional price differences (deflated by Upper PL) to obtain "real" ginis for each year  
 2) Absolute Gini for year *t* is normalized by the mean per capita exp. of the base year (2000), and *not* by the mean of the distribution of year *t*.

27. The contrast between changes in relative and absolute inequality is also seen from the real consumption levels of different percentiles. Figure 7 shows that the ratios between different percentiles of per capita real consumption have remained almost unchanged from 2000 to 2005, which is consistent with the unchanging relative Gini indices in Table 4. On the other hand, the absolute *sizes* of the

differences between higher and lower percentiles have increased from 2000 to 2005, consistent with the increase in the absolute Gini index in Table 5.

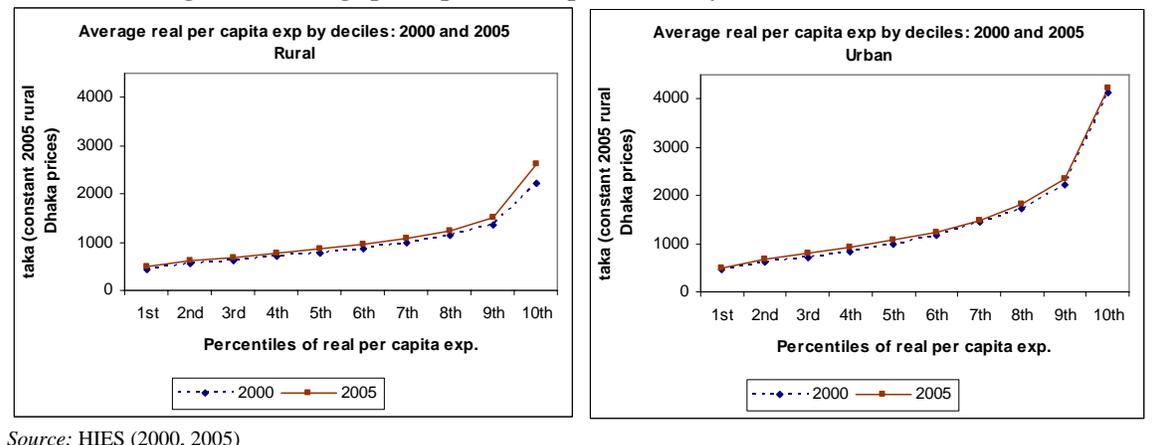
**Figure 7: Relative and absolute inequality – ratio of selected percentiles and gaps between percentiles of per capita real expenditures**



28. **How do the observed growth rates for different deciles translate to the size of the gaps in consumption levels between deciles?** Growth rate of per capita mean expenditure was 10 percent or more for all deciles between 2000 and 2005, and around 14 percent for bottom and top deciles (see Figure 4), which resulted in the ratio between mean per capita expenditures of the top and bottom deciles remaining unchanged at 6.4. However, the gap between the per capita mean expenditures of the top and bottom deciles increased from 2310 tk in 2000 to 2640 tk in 2005 (at constant 2005 rural Dhaka prices).

29. A disaggregation between the rural and urban sectors provides additional insights. The gap in consumption between the upper and lower ends of the distribution is higher for the urban population, as seen from the steeper urban curve in Figure 8. However, Figure 8 also shows that this gap has remained almost unchanged over time for the urban population, but widened for the rural population – the rural curve is steeper in 2005 than in 2000. These results are also entirely consistent with the absolute Gini indices listed in Table 5.

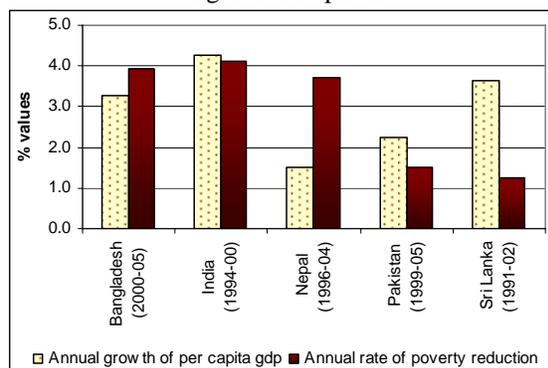
**Figure 8: Average per capita real expenditures by decile - rural and urban**



## Growth and poverty reduction – a cross-country comparison

30. **Bangladesh’s rate of poverty reduction – particularly in the most recent period of 2000-05 – compare well with that of other South Asian countries for which household data are available.** Such comparisons are always fraught with risks, primarily because each country uses a different national poverty line that reflect their own consumption patterns as well as national consensus on what method and calorie threshold are appropriate for the poverty line. These inconsistencies are especially problematic when comparing the poverty level of one country with that of another, which will not be attempted here. The problems are less severe in comparing the *extent of poverty reduction* across countries (over somewhat comparable periods), since that involves measuring the change in each country with the poverty line held constant in real terms. But even such comparison is made difficult by the fact that countries do not conduct their household surveys during the same year, and in some cases, the results are available long after the survey is completed.

**Figure 9: Annual average growth in GDP and reduction in poverty headcount**  
A regional comparison



Source: See Table 6

Note: 1) Poverty lines are defined differently across countries; so poverty headcount ratios are not comparable across countries.  
2) Annual rates of reduction in poverty are *negative* of the % values shown by the dark bars.

31. With these caveats, a regional comparison suggests that **the pace of poverty reduction in Bangladesh has been among the highest in the region in the recent past.** The average annual percentage rate of poverty reduction in Bangladesh over the period 2000-05 was second only to that for India – among all South Asian countries for which data is available over (roughly) comparable periods (Figure 9).

32. Moreover, comparing the average annual rate of growth in GDP with the annual rate of poverty reduction over similar periods for each country, **growth in Bangladesh appears to have been more pro-poor than in other South Asian countries with the sole exception of Nepal.** The ratio of the height of the dark bar to the light bar in Figure 9 can be taken as a rough measure of responsiveness of poverty to GDP growth (elasticity), and this ratio is obviously higher in Bangladesh than for India, Nepal, Pakistan and Sri Lanka. Note however that this is a highly simplified measure of elasticity of poverty to growth, and more careful estimations for Bangladesh will be presented in Section III below.

33. **A stronger link between growth and poverty reduction in Bangladesh is also consistent with what is seen for the (relative) Gini of per capita consumption, compared to other South Asian countries.** Table 6 shows that while the national Gini for Bangladesh did not increase during 2000-05, unlike almost every other country in South Asia (with the sole exception of Pakistan). Stable relative inequality explains why Bangladesh during 2000-05 has been able to reduce poverty at a rate close to India’s (and higher than that for all other countries in the region), even though the annual average GDP growth in Bangladesh has been lower than that for India and Sri Lanka.

**Table 6: Poverty and Inequality in the South Asia region**

	Periods	Gini of per capita consumption		Poverty headcount rate		GDP per capita (constant 2000 \$)	
		Start	End	Start	End	Start	End
	Start -- End year						

<b>Bangladesh</b> <sup>(1)</sup>	2000---05	0.31	0.31	48.9	40	353	415
<b>India</b> <sup>(2)</sup>	93/94 --- 99/00	0.29	0.32	29.2	22.7	353	454
<b>Nepal</b> <sup>(3)</sup>	95/96 --- 03/04	0.34	0.41	41.8	30.9	206	232
<b>Pakistan</b> <sup>(4)</sup>	98-99 --- 04/05	0.31	0.3	32	29.2	522	596
<b>Sri Lanka</b> <sup>(5)</sup>	90/91 --- 2002	0.32	0.4	26.1	22.7	595	880

*Source:* (1) HIES (different rounds); (2) Staff Estimation based on Deaton and Dreze (2002); (3) World Bank (2006); (4) World Bank staff estimation based on PIHS 2000-01 and 2004-05; (5) HIES surveys (DCS)

*Note:* Poverty lines are defined differently across countries; so poverty headcount ratios are not comparable across countries.

**34. The pace of poverty reduction in Bangladesh however is much lower than what is seen for fast-growing East Asian countries, like China, Thailand and Vietnam** (Table 7). While all three countries experienced higher per capita GDP growth rates than Bangladesh in the recent past, two of these countries also have comparable elasticity of poverty to growth (Thailand is the only exception with a much higher elasticity). This suggests that if Bangladesh is able to attain GDP growth comparable to East Asian levels, it may also match the pace of poverty reduction seen in these countries. Vietnam is a telling example; around 1990 both Bangladesh and Vietnam had similar poverty rates (58%). By 2005, Bangladesh had twice as many poor people (40% compared with Vietnam's 20%).

**35. In terms of poverty reduction in the recent past, Bangladesh compares favorably with African countries with a similar level of GDP per capita.** Kenya experienced a slight increase in poverty rates between 1994 and 1997 while its economy grew at an annual rate of 0.3 percent. Mauritania reduced poverty rates at an annual rate of 1.7 percent and registered an annual growth rate of 1.8 between 1996 and 2000. In Burkina Faso, the poverty rate declined at an annual rate of 3.5 percent with the economy growing at an annual rate of 1.8 percent. Bangladesh outperformed all of these countries in poverty reduction. This is because Bangladesh had higher rates of per capita GDP growth than all three countries, while also having a higher ratio of poverty reduction to growth (elasticity) than two of the countries (Burkina Faso was the only exception).

	Years	Annual rate of poverty reduction	Annual growth rate	Growth elasticity*	GDP per capita at the latest year with poverty estimates	
Sub-Saharan Africa	Kenya	1994-1997	9.1	0.3	26.4	320
	Burkina Faso	1998-2003	-3.5	1.9	-1.9	247
	Mauritania	1996-2000	-1.7	1.8	-0.9	409
East Asia	China	1990-2001	-8.3	8.8	-1.0	1021
	Thailand	1990-2002	-9.0	3.5	-2.6	2110
	Vietnam	1993-2002	-7.4	5.4	-1.4	444
<b>Bangladesh</b>	<b>2000-2005</b>	<b>-3.9</b>	<b>3.3</b>	<b>-1.2</b>	<b>415</b>	

*Source:* All real per capita GDP data are from WDI (2006) and poverty data for all Sub-Saharan African countries are also from WDI (2006). Information on poverty headcount ratios for East Asian countries comes from: China—Ravallion and Chen (2004); Thailand—Jitsuchon, S. (2004); and Vietnam—Glewwe et.al. (2000) and Carolyn Turk (2005).

*Note:* \*A crude measure of elasticity – the ratio of annual rate of poverty reduction to annual GDP growth rate.

**36. In concluding this section, it is useful to recap the main findings.** Bangladesh has experienced substantial poverty reduction during the last 15 years (between 1991-92 and 2005). The pace of poverty reduction has been especially rapid during 2000-2005 for both rural and

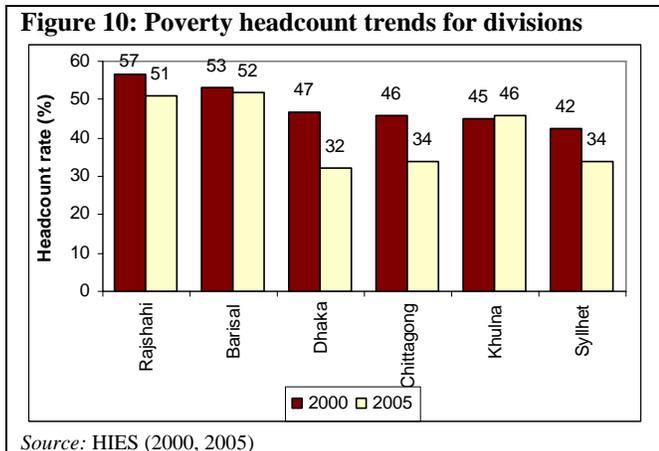
urban areas of the country, by all indicators of poverty – proportion of the population under the poverty line and the extreme poverty line, and the level and distribution of consumption among the poor. Rapid growth in consumption has been the primary underlying factor behind poverty reduction, and growth has occurred at similar rates for the poor and non-poor alike, which has also meant that relative inequality has remained almost unchanged for the country as a whole. At the same time, given the large disparity in the initial (2000) distribution of consumption, similar growth rates for all consumption groups necessarily imply an increase in the average size of the gap in consumption between the poor and the non-poor, and this has indeed occurred.

37. There are differences between urban and rural areas in the patterns of growth and distributional changes. For rural areas, consumption growth has been the dominant force in reducing poverty; whereas in urban areas, a small reduction in inequality has also had a sizeable poverty reducing impact. Absolute inequality or the size of the gap in consumption between different groups has expanded in rural areas, while remaining almost unchanged in urban areas.

38. Poverty reduction in Bangladesh in 2000-05 compares well with other South Asian countries in recent years, with an annual average rate of reduction second to only that for India. Bangladesh could achieve this in part due to strong growth, and in part due to no appreciable increase in inequality, with the result that GDP growth had a higher impact on poverty in Bangladesh than for all countries in the region with the exception of Nepal. In comparison with some select Sub-Saharan African countries with comparable per capita GDP levels, Bangladesh’s performance in both poverty reduction and economic growth is favorable<sup>5</sup>. However as Asia becomes more regionally integrated it is natural for Bangladesh to “look East”. Comparisons with Vietnam, China and Thailand underscore the importance of higher growth to make even further reductions in poverty. Moreover while the lessons from East Asia are manifold the investments in skills and in creating several growth poles within each country are highly relevant for Bangladesh’s development path.

## II. Regional and Urban-Rural Gaps

39. While poverty reduction has occurred for both rural and urban areas, a **disaggregation by geographic regions reveals sharp regional variations**. The largest decline in poverty incidence occurred for the Dhaka division, followed by Chittagong and Sylhet. By contrast, poverty headcount stagnated in Barisal and increased slightly for Khulna. As a result of this unequal pattern of poverty reduction, regional differences were quite sharp in 2005. The poverty headcount ranged from a low of 32 percent in Dhaka and 34 percent in Chittagong and Sylhet to over 50 percent in Barisal and Rajshahi.

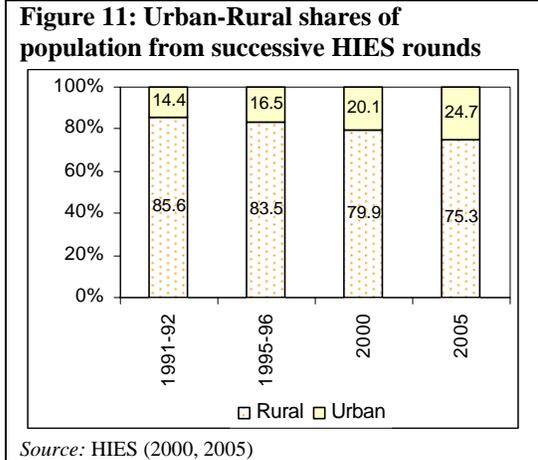


40. The results of a decomposition exercise bring the uneven pattern of poverty reduction into sharp focus. Dhaka and Chittagong divisions are found to have contributed to as much as 79

<sup>5</sup> However, this comparison needs to be treated with caution since poverty data from African countries are slightly outdated.

percent of the reduction in national poverty headcount between 2000 and 2005, while accounting for just over half the population in 2000. At the other extreme, Khulna and Barisal with about 20 percent of the population in 2000 have zero contribution to poverty reduction. Rajshahi and Sylhet, with 30 percent of the population in 2000, have contributed the remaining 21 percent of national poverty reduction. The decomposition also reveals that *intra*-divisional effects explain all of the aggregate poverty reduction; population shifts *between* divisions or the interaction between the two effects play negligible parts in the explanation (see Annex, Table A-1.3).

41. **The results are different when poverty change is decomposed by sectors (urban/rural) rather than divisions.** Rural and urban sectors are seen to contribute 77 and 15 percent of the aggregate poverty reduction respectively, which are lower than each sector’s share in total population in 2000 (80 and 20 percent respectively). This occurs because the population shift effect in this case accounts for a substantial (9 percent) of the total change in poverty, unlike what was seen for the earlier decomposition (Annex, Table A-1.3).

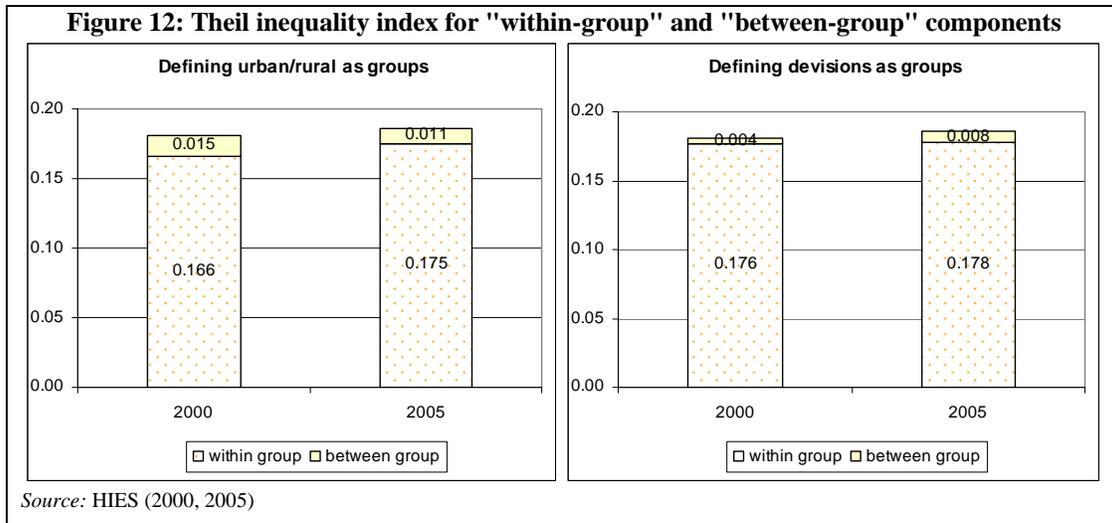


42. The significance of the population shift effect arises from a **nearly-5 percentage point shift in population from rural to urban sector between 2000 and 2005** (Figure 11). This represents a substantial 23 percent increase in urban share of the population (or a 6 percent reduction in rural share) over a period of 5 years. While this population shift is not as dramatic when compared with previous survey periods – the urban population share increased by 22 percent from 1995-96 to 2000 and by around 15 percent in previous 5-year periods – it certainly represents an important phenomenon. Understanding the nature and drivers of this apparently rapid process of urbanization, along with its impact on poverty reduction, will be important questions to examine through further analysis.

### Comparing regional and urban-rural gaps

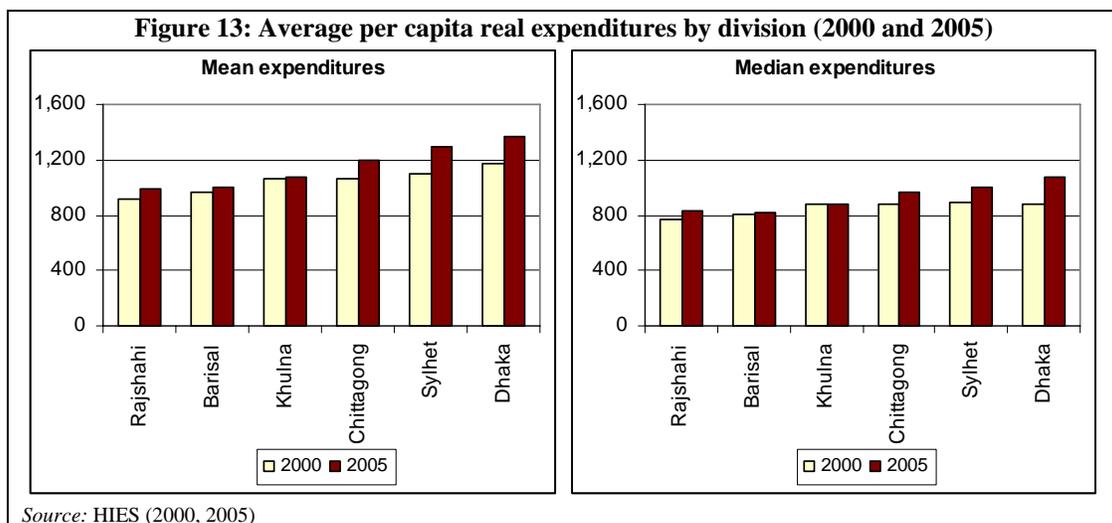
43. There is some evidence to indicate that **differences between regions/divisions, rather than those between urban and rural areas, have increased on the average from 2000 to 2005.** This is suggested by the Theil inequality index of per capita consumption which, unlike the Gini index, can be decomposed into within-group and between-group indices.

44. **“Between-division” inequality increased proportionately more than “within-division” inequality from 2000 to 2005.** While the slight increase in national Theil inequality index from 2000 to 2005 (from 0.181 to 0.186) is attributable to increases in between-division *and* within-division components, the share of the former in total inequality increased from 2.4 to 4.5 percent (Figure 12). On the other hand, when groups are defined as urban/rural, the slight increase in the national index is attributable *only* to increases in the within-group index, since the value of the between-group index fell (Figure 12). The increase in within-group index is in turn attributable to an increase in the rural index, with the urban index showing a decline (see Annex, Figure A-1.5).



45. **It is important however to not overstate the importance of these results.** Firstly, the contribution of between-group inequality to total inequality, irrespective of how groups are defined, is very small compared to that of within-group inequality. Secondly, comparing the indices of between-division inequality and between urban/rural inequality, the former is smaller than the latter in both years, indicating that the urban-rural gap is larger on the average than regional gaps.

46. **The urban-rural gap in average per capita consumption expenditure has shrunk to some extent, while the variation between regions/divisions has increased.** Table 3 in Section I showed that the cumulative growth in average per capita real expenditure was 12 percent for rural areas, compared to 5 percent for urban areas. Figure 13, on the other hand, suggests that the differences in average real per capita expenditures between the poorer and richer divisions have increased. The highest growth in mean and median per capita expenditures occurred for Dhaka and Sylhet divisions, which also had the highest expenditure levels in 2000. Rajshahi and Barisal, which had the lowest per capita expenditure levels in 2000, experienced far lower growth in expenditures.



47. Interestingly, for all divisions other than Dhaka, the increase in mean expenditures is seen to be higher than that in median expenditures. This suggests that **for all divisions but Dhaka,**

**inequality in per capita consumption within division increased between 2000 and 2005.** The Theil inequality indices of per capita real consumption in Table 8 confirm this – Dhaka is the only division where the Theil index declined (by 20 percent) from 2000 to 2005, while it remained unchanged in Rajshahi and increased by between 14 and 60 percent in the other four divisions.

48. The changes in inequality within divisions (Figure 12) and average expenditure levels for divisions (Figure 13) suggest an underlying story for the regional poverty trends shown in Figure 10. The largest poverty reduction (of 31 percent) in Dhaka division occurred due to high growth in per capita consumption as well as sharp reduction in inequality within. In contrast, poverty

reduction in Chittagong and Sylhet (of 26 and 20 percent respectively) was driven by consumption growth, while significant increases in inequality dampened some of that impact. A modest

reduction in poverty (of 10 percent) in Rajshahi was driven by a similar rate of growth in consumption, with little or no change in inequality within. Barisal and Khulna saw no reduction in poverty on account of anemic growth along with increasing inequality within each division.

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Sylhet
2000	0.134	0.140	0.248	0.132	0.135	0.157
2005	0.180	0.173	0.197	0.151	0.135	0.251
<i>% change</i>	33.9	23.6	-20.4	13.9	0.0	60.5
<i>Source: HIES (2000, 2005)</i>						

### **Regional patterns at a more disaggregated level**

49. Although the accuracy of estimates below division level is considerably lower and therefore need to be treated with caution, consumption growth rates for urban and rural areas within divisions provide some hint of the pattern of poverty reduction within each division.

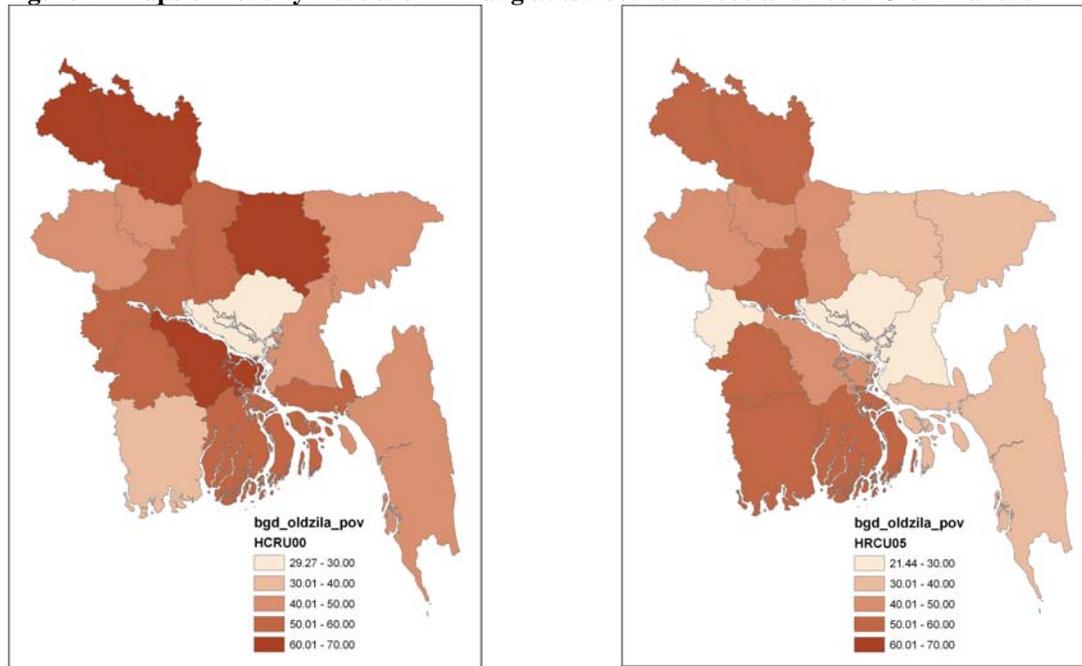
50. *Variations within urban and rural sectors.* The growth rates of real mean per capita consumption for rural and urban areas (12 and 5 percent respectively during 2000-05 – see Table 3 in Section I) masks a high degree of variation within each sector. Rural consumption growth rates during 2000-05 range from 3-4 percent for rural Barisal, Khulna and Chittagong to 11 percent for Rajshahi and Sylhet and 27 percent for rural Dhaka. Urban consumption growth rates go from -12 percent in urban Khulna to 62 percent in urban Sylhet. Within the urban sector, the growth rate of average consumption is 3.5 percent for urban municipalities and 6 percent for SMAs (see Annex, Table A-1.4).

51. The extreme variation in urban growth rates across divisions is underscored by the fact that while Chittagong and Sylhet urban areas registered real per capita consumption growth of more than 35 percent over the period 2000-05, other urban areas experienced no growth (urban Dhaka) or negative growth (urban areas of Barisal, Khulna and Rajshahi). Disaggregating further (between SMAs and urban municipalities within divisions), the growth rates were especially high for the Chittagong SMA and Sylhet urban municipalities (Annex, Table A-1.4). It is relevant to note that SMAs and urban municipalities accounted for 14 and 11 percent of the total population in 2005, respectively.<sup>6</sup> Dhaka and Chittagong accounted for 88 percent of the SMA population in 2005, and 41 percent of the population of urban municipalities.

<sup>6</sup> SMAs account for 67 percent of the population of Dhaka and 21 percent of the population of Chittagong; while urban municipalities account for 25 and 17 percent of the population of Dhaka and Chittagong respectively.

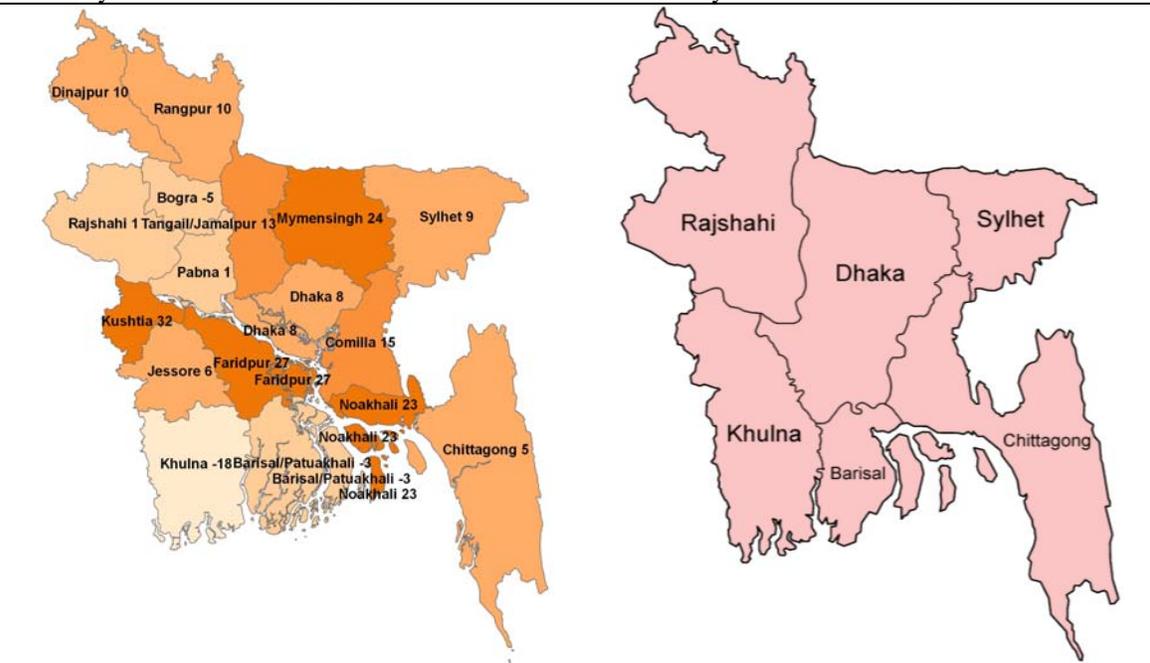
52. Poverty trends estimated for these levels of disaggregation (rural-urban within each) largely follow the trends of consumption growth. The results clearly indicate that poverty reduction in Dhaka and Rajshahi divisions (much larger for Dhaka) occurred mainly due to rural consumption growth; whereas urban growth was the primary factor behind poverty reduction in Chittagong and Sylhet divisions.

**Figure 14 Maps of Poverty Reduction in Bangladesh between 2000 and 2005: Old Zilla level**



a. Poverty headcount rates – 2000

b. Poverty headcount rates – 2005



c. Poverty reduction between 2000 and 2005 (percentage points):

d. Current divisional boundaries– for comparison with the old Zilla boundaries

Note: numbers in map indicate difference between 2000 and 2005

53. **Poverty patterns at the level of (old) zillas.** Previous results, disaggregating poverty incidence at the level of divisions, suggested that on the average the gaps *between* regions have expanded from 2000 to 2005 and contribute more to aggregate inequality in 2005 than in 2000. However, this result must be qualified by the fact that a division is perhaps too large a geographic area to provide a clear picture of regional differences. A more nuanced picture on the regional patterns emerges from disaggregating poverty incidence **at the level of the old Zillas** (districts). Figure 14, c. and d. compare the old *zilla* boundaries with the divisional boundaries. Since the data is not strictly representative at this level of disaggregation, these results are subject to larger standard errors and must be interpreted with caution. At the same time, the sample sizes are large enough at this level for every *zilla* for the comparisons over time and across *zillas* to be acceptable for an analysis intended as indicative rather than definitive.

54. In 2000, poverty rate for Dhaka district (old *zilla*) was 29 percent, much lower than for any other district in the country (Figure 14a.). But in 2005, the gap between Dhaka *zilla* and the rest of the country has narrowed to some extent, with a number of other *zillas* with poverty rates closer to that for Dhaka (Figure 14b). **Poverty reduction was particularly high for zillas adjacent to Dhaka zilla** – some within Dhaka division (Mymensingh, Jamalpur and Faridpur) and others in Chittagong division (Comila and Noakhali). Poverty reduction in all other *zillas*, with the sole exception of Kushtia (Khulna division), has been lower than the average reduction for the country as a whole.

55. Poor *zillas* such as Rangpur and Dinajpur have reduced poverty during 2000-05 at rates on par with the national average, but due to their very high initial poverty, still remain among the poorest *zillas* in the country. Poverty reduction in Dhaka, Sylhet and Chittagong *zillas* are actually slightly lower than the country average. However, given the initially lower poverty in these areas relative to the rest of the country, these continue to be much less poor than the rest of the country in 2005; poverty incidence for Dhaka *zilla* is almost half the national rate. Khulna and Bogra are the only *zillas* that have seen a significant *increase* in poverty.

56. In terms of the general spatial trend, there is a marked contrast in poverty reduction between the eastern and western parts of the country. The eastern part of the country had the most significant reductions in poverty, with the highest reductions occurring in the poorest *zillas* in 2000, namely Mymensingh, Faridpur and Noakhali. In other words, **there is some convergence towards a lower poverty rate in the eastern part of the country, and particularly among zillas neighboring the most affluent Dhaka zilla.** The pattern suggests that the relative affluence of Dhaka *zilla*, which is also the economic hub of the country due to the presence of the capital city, has had an increasingly beneficial effect on adjacent areas.

57. In contrast, **the western part of the country has seen much smaller reduction in poverty, and there is no pattern of convergence among the zillas.** The increase in poverty in Khulna *zilla* has been responsible for the lack of progress in Khulna division, in spite of significant poverty reduction in Kushtia *zilla* in the same division, which is the only area in western Bangladesh that has seen such improvement between 2000 and 2005.

58. **The main findings of this section are summarized below.** There was sharp regional variation in the pattern of poverty reduction between 2000 and 2005 in Bangladesh. The largest decline in poverty occurred for the Dhaka division, followed in descending order of magnitude by Chittagong, Sylhet, Rajshahi, and Barisal (stagnation in poverty) and Khulna (slight increase). Dhaka and Chittagong divisions contributed to 79 percent of the reduction in national poverty

headcount, with just over half the national population in 2000. At the other extreme, Khulna and Barisal with about 20 percent of the population in 2000 had zero contribution to poverty reduction.

59. No discernible association between growth and distributional changes was seen from the patterns across regions/divisions. Poverty reduction in Dhaka division occurred due to high growth in per capita consumption and reduction in inequality within, Chittagong and Sylhet experienced high growth with rising inequality, and Rajshahi lower growth with little change in inequality. Barisal and Khulna saw no reduction in poverty on account of anemic growth along with increasing inequality within each division. Consumption growth patterns for urban and rural areas within divisions suggest that while rural consumption growth was the primary driver of poverty reduction in Dhaka and Rajshahi divisions, urban consumption growth was the dominant factor in Chittagong and Sylhet divisions.

60. Underlying the overall consumption growth and poverty trends for rural and urban areas is a high degree of variation within each sector. Growth in per capita real consumption during 2000-05 ranged from 3-4 percent to 27 percent in rural areas, and from -12 to 62 percent in urban areas. Within the urban sector, the growth rate of average consumption was 3.5 percent for urban municipalities compared to 6 percent for SMAs. While Chittagong and Sylhet urban areas registered real per capita consumption growth of more than 35 percent over the period 2000-05, other urban areas experienced zero or negative growth. Poverty trends estimated for these levels of disaggregation (rural-urban within each) largely follow the trends of consumption growth.

61. While there was little change in population shares among divisions during 2000-05, a relatively large rural-to-urban shift in population share accounted for a substantial proportion (9 percent) of the total change in poverty between 2000 and 2005. On the average, differences between divisions, rather than between urban and rural areas, appears to have increased from 2000 to 2005. Moreover, inequality *between* divisions increased proportionately more than that within divisions from 2000 to 2005. All these suggest that there is no evidence for convergence among regions for the country as a whole in consumption level and poverty.

62. A more disaggregated picture, using (old) *zillas* as the unit of analysis reveals a more nuanced picture. Poverty reduction was found to be particularly high for *zillas* adjacent to Dhaka *zilla*, while almost all other *zillas* underperformed relative to the country average. Moreover, there is a distinct East-West divide. The eastern part of the country had significant reductions in poverty; and the highest reductions occurred in the poorest *zillas* of 2000 suggesting regional convergence *within* the East. This may be a result of the relatively affluent Dhaka *zilla* – the economic hub of the country – exerting an increasingly beneficial effect on its neighboring areas. In contrast, the western part of the country has seen much smaller reduction in poverty, and there is no pattern of convergence among the western *zillas*.

### ***III. The Relationship between Poverty and Growth –Elasticities and Projections***

63. As shown in Section I, poverty reduction in Bangladesh has been uneven over the last 15 years, when the three interim periods are considered (see Figure 2). Consistent with the pattern of poverty reduction – higher during the periods 91/92-95/96 and 2000-2005 – annual growth in real per capita consumption was 3.8 percent between 91/92 and 95/96, 0.5 percent between 95/96 and 2000, and 2.3 percent between 2000 and 2005 (Table 9). The period of 91/92-95/96 also saw a significant increase in inequality, with the (relative) Gini of per capita consumption increasing by more than 15 percent between 91/92 and 95/96 (see Table 4). However, subsequent economic expansion has occurred without further worsening of relative inequality, with the national Gini remaining stable at the 95/96 level. The rise in relative inequality between 91/92 and 95/96 explains why the reduction in poverty during this period, in spite of a higher annual growth in per capita consumption, was smaller than what was seen for 2000-2005.

<b>Table 9: Growth of real per capita expenditure (%)</b>	
91/92-95/96	3.84
95/96-2000	0.48
2000-2005	2.27
<i>Source:</i> HES 1991-92, 1995-96, and HIES 2000, 2005.	
<i>Note:</i> Nominal expenditures are deflated by price indices to adjust for inflation over time and upper poverty lines to adjust for regional price differences.	

64. **The emerging patterns of growth and inequality changes are encouraging for poverty reduction in Bangladesh.** Continuing with the trend during recent years, if robust growth is achieved without increasing relative inequality, significant poverty reduction is likely to occur. An interesting question in this context is whether, and under what conditions, can Bangladesh achieve the Millennium Development Goal (MDG) of halving the proportion of people living in extreme poverty from the 1990 level by the year 2015.

65. **One simple way of estimating a future poverty trend is by using growth elasticity of poverty,** i.e., the percentage reduction in poverty obtained with a one percent growth in consumption, along with different scenarios for GDP growth. There are different methodologies for estimating growth elasticity, which can yield different poverty projections for the same growth scenario. In this section, three commonly used methodologies are employed on data for earlier years, to yield poverty projections for 2005, which are then compared with the actual poverty rate of 2000 to select the most appropriate method for estimating the elasticity. Projections for future poverty trends are produced using the selected methodology, based on different scenarios for future GDP growth.

### Conceptual framework

66. Economic growth can affect poverty via two major paths: an increase in mean household income/consumption expenditure and a change in income/consumption distribution. Growth, by definition, increases national income, but in conducting projections it is also critical to take into account the impact on poverty *via* a change in income/consumption distribution caused by the growth.

67. Methodologically, the growth elasticity of poverty can be decomposed as:  $\lambda \approx \gamma + \beta\delta$ , where  $\gamma$  denotes the gross elasticity of poverty to growth (the percentage reduction in poverty obtained with one percent growth rate holding inequality constant);  $\beta$  the elasticity of inequality to growth (the percentage change in inequality associated with one percent growth rate); and  $\delta$  the elasticity of poverty to inequality controlling for growth (the percentage increase in poverty resulting from a one percent increase in inequality holding growth constant). The *direct growth impact* is represented by  $\gamma$  and the *indirect growth impact via inequality/distribution* is represented by  $\beta\delta$ . The net elasticity of poverty to growth ( $\lambda$ ), i.e., the percentage decrease in poverty obtained from a one percent growth rate, while allowing inequality to change, can be approximated by the sum of the *direct* and the *indirect* impacts.

68. This section compares three commonly used methodologies to estimate both the direct and the indirect effects: (1) *Regression method* (used in the previous Poverty Assessment); (2) *Bourguignon (2002) method*; and (3) *Datt-Ravallion (1992) method*. The methodology that performs best in predicting the national poverty rate of 2005 using data from the previous surveys is then selected to generate future poverty projections (see Annex for a brief description of each methodology, with its pros and cons).

### Comparing the estimates from three methods

69. The performance of these three methods is examined by projecting 2005 poverty rate from 2000 poverty rate and the estimates of net growth elasticity of poverty by the above methodologies.

70. Table 10 shows Datt-Ravallion (1992)'s method projects the poverty rate of 2005 that is closest to the actual 2005 poverty rate estimated from HIES 2005. Regression method also provides fairly good projections; however, the indirect effect via inequality seems to be too high in the light of the fact that the Gini coefficient did not change much between 2000 and 2005.<sup>7</sup> Projection based on Bourguignon (2002)'s method matches the actual poverty rate of 2005 less closely than for the other two methods. This might be in line with the fact that log of per capita expenditure does not pass a normality test. As a result, Datt-Ravallion (1992)'s method is selected for projecting future poverty rates. Nevertheless, the similarity in projections based on the Datt-Ravallion method and the regression method confirms that the projections are reasonably stable across different methods.

### Projected poverty trends

71. Three alternate growth scenarios were considered – namely that real GDP in Bangladesh would grow by 4.5, 5.3 and 7.5 percent per annum – to forecast the head-count index of poverty until the year 2015. The annual growth rate of 5.3 percent is a baseline scenario in that the average annual growth rate of real GDP between 2000 and 2005 is 5.3 percent.

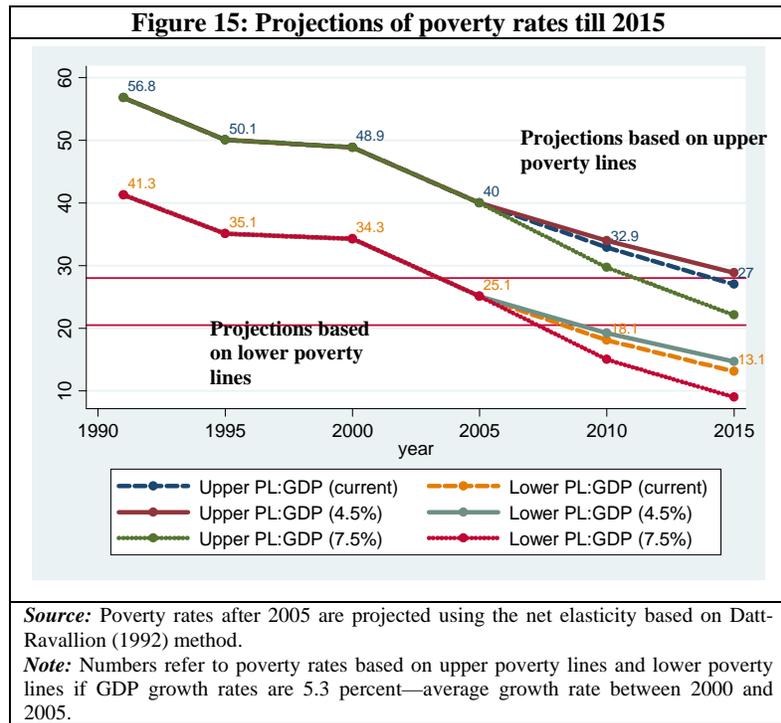
72. The growth rates of real GDP need to be converted to that of per capita consumption expenditure from household surveys since the net elasticity of poverty to growth estimated above was estimated with respect to per capita household expenditure. Between 2000 and 2005, the annual growth rate of per capita household consumption expenditure is 2.3 percent in comparison to the GDP growth rate of 5.3 percent. For other scenarios, the same conversion rate is applied: 4.5 percent and 7.5 percent of real GDP growth rates are converted to 1.9 percent and 3.2 percent of per capita household

	Regression method	Bourguignon (2002)	Datt-Ravallion (1992)
Growth Elasticity			
Direct ( $\gamma$ )	-2.26	-1.79	-1.62
Indirect ( $\beta\delta$ )	0.64	0.00	0.12
Net Elasticity ( $\lambda$ )	-1.62	-1.79	-1.51
Projected 2005 poverty rate (%)	39.5	38.5	40.1
Actual 2005 poverty rate (%)	40.0		
<i>Source:</i> Staff estimation using HIES 1991-92, 1995-96, 2000, and 2005			
<i>Note:</i> "NA" refers to "Not Available". "Actual 2005 poverty rate" refers to the poverty rate estimated from HIES 2005. "Projected 2005 poverty rate" refers to the poverty rate estimated from the actual 2000 poverty rate and the net growth elasticity.			

<sup>7</sup> If upper poverty lines are used to adjust per capita consumption expenditure for spatial price differences, Gini coefficients in 2000 and 2005 are 0.307 and 0.309, respectively.

consumption expenditure from HIES 2000 and 2005.<sup>8</sup>

73. Figure 15 shows the estimated decline in poverty in Bangladesh under alternate growth scenarios. If the per capita GDP were to grow at the current rate (5.3 percent) between 2005 and 2015, the incidence of poverty (with respect to upper poverty lines) would decline from 40 percent in 2005 to 27 percent by 2015, which means Bangladesh will *meet the MDG of halving poverty rates between 1990 and 2015*. However, if the country were to grow at only 4.5 percent per annum, poverty reduction would likely not meet the MDG target. By contrast, if the country were to instead grow at 7.5 percent per annum over this period, the incidence of poverty would decline to 22 percent by 2015, well below the MDG target.



74. Using poverty estimates based on the *lower poverty lines*, the incidence of extreme poverty in Bangladesh would decline from 25 percent in 2005 to 15 percent in 2015 under the 4.5 percent growth scenario, or to 9 percent under the 7.5 percent growth scenario. These indicate that for both the high-case and low-case growth scenarios considered here, Bangladesh would be well on track to halve extreme poverty by 2015 from the 1990 level (if the lower poverty line is taken as the threshold for extreme poverty).

75. It is important to note however that these projections are based on elasticities estimated from historical data, which are not perfect predictors for future trends. In other words, actual poverty reduction, given any growth rate, can be quite different from what was experienced in previous periods if the distributional impact of growth changes from what was seen in recent years. This could happen because a growth process can generate all sorts of dynamic changes in the economy, for which history is an imperfect guide. Therefore, the projections shown here must be interpreted carefully, as showing the poverty reduction path *if* the current association between growth and distributional changes in Bangladesh were to hold for the future, rather than as definitive future trends.

#### IV. Concluding remarks

<sup>8</sup> In the previous Bangladesh Poverty Assessment, projection of national poverty rates was done after projecting poverty rates for urban and rural areas separately. This approach was not adopted this time because there is no simply way to isolate migration effect from urban and rural growth elasticity estimates.

76. This paper has shown that rapid poverty reduction in Bangladesh during 2000-2005, which occurred in both urban and rural areas, was a result of strong growth in average consumption levels. Moreover, there was no increase in inequality in the relative sense, i.e. the growth in consumption occurred at similar rates for the poor and non-poor alike, resulting in a elasticity of poverty reduction to growth that was higher than most South Asian countries. Extrapolating forward from the historical estimates of elasticity, Bangladesh is therefore poised to attain (and surpass) the MDG target of halving its poverty headcount rate from the 1991 level by 2015 if the current GDP growth rate is maintained, provided the trend in distributional changes does not depart from what was seen in recent years.

77. Underlying the overall positive picture, the country still faces significant challenges. While relative inequality has not worsened, similar rates of consumption growth for upper and lower ends of the distribution imply that absolute inequality, i.e. the size of the gaps between the rich and the poor, has widened. The poor in Bangladesh, particularly the 25 percent of the population who are below the lower poverty line, still consume at very low levels. Further work is necessary to understand the factors that are responsible for limiting the income/consumption of the poor, as well as the multi-dimensional nature of poverty going beyond consumption.

78. The analysis at a geographically disaggregated level shows that the pattern of poverty reduction has been highly uneven across regions. Poverty has declined rapidly in Dhaka, Chittagong and Sylhet divisions in recent years, while remaining stagnant in Rajshahi and Barisal and increasing in Khulna division. On the whole, between-division differences seem to have widened slightly from 2000 to 2005. More importantly, analysis at a lower level of disaggregation (old *zillas*), hints at an emerging regional divide in the country. There appears some convergence towards a lower poverty rate in the eastern part of the country, and particularly among areas neighboring the most affluent Dhaka *zilla*. In contrast, the western part of the country has seen much smaller reduction in poverty, and there is no pattern of convergence with some of the (old) *zillas* in fact becoming poorer in 2005.

79. Whether such a pattern of poverty reduction is a result of an increasing positive impact of the main urban center of the country (Dhaka) on neighboring areas, is a question to be explored in future work. Related to this would also be the important question of what factors explain the regional differences in poverty incidence and rate of poverty reduction – in other words, what region/area specific characteristics are responsible for certain regions to lag behind the rest of the country. These issues are explored in greater depth in a separate background paper for the Poverty Assessment (Shilpi 2007).

## Annex: Trends and Patterns of Poverty in Bangladesh in Recent Years

### I. *Poverty measurement in Bangladesh – a brief overview*

The World Bank and the Bangladesh Bureau of Statistics (BBS) have had a long-standing partnership on poverty measurement issues using data from successive rounds of the Household Income Expenditure Surveys (HIES). The World Bank supported the design and implementation of the 2005 HIES and a Bank team has been working with BBS analysts over the past several months on deriving nationally representative poverty and inequality estimates.

Intuitively, Cost of Basic Needs (CBN) poverty lines represent the level of per capita expenditure at which a household can be expected to meet their basic needs (food and non-food). As prices and consumption patterns vary between different geographical areas, poverty lines are estimated for each of 16 different geographical areas or sampling *strata*. To ensure that comparisons over time are made on the basis of poverty lines that represent the same purchasing power, CBN poverty lines estimated for the new base year of 2005 were then deflated by an appropriate price index to derive poverty lines for 2000. In the course of the BBS-World Bank collaboration, a number of methodological issues were examined closely, which can be classified into two broad categories: (i) updating the pre-existing poverty lines to 2005, using price indices to adjust for changes in cost of living; and (ii) re-estimating poverty lines using the 2005 data and deflating these lines with price indices to obtain comparable poverty figures for previous survey years. Under (ii), a number of different approaches were tried out, including estimating a single poverty line for the country and calculating appropriate spatial price indices to adjust for geographic differences in cost of living, in lieu of estimating poverty lines separately for each stratum.

BBS in consultation with the Planning Commission decided on one method out of the different options explored, which involves re-estimating poverty lines from HIES 2005 for 16 different strata using the Cost of Basic Needs (CBN) method – similar to that used to derive poverty lines based on HIES 1991-92. Re-basing the poverty lines using 2005 data – as opposed to just updating the previous lines for cost of living – ensures that these are based on the latest underlying sampling frame (using Census 2001), and also conforms to the view that poverty lines should be re-based every 10-15 years to reflect changes in consumption patterns.<sup>9</sup> Box 1 below describes the exact steps involved in implementing the selected method.

#### **Box 1: Deriving poverty lines for Bangladesh**

How to estimate *what it would cost a household to meet its basic needs* in the base year (2005)? *First*, the cost of a fixed food bundle was estimated. This bundle, consisting of 11 key items, which has been used in Bangladesh through its entire history of poverty measurement, provides minimal nutritional requirements corresponding to 2122 kcal/day/person. The food poverty lines were computed by pricing this bundle with the average price of each item for each of the fifteen geographic areas. The *second* step entailed computing two “allowances” for non-food consumption. The first was calculated as the average amount spent for non-food items by those households whose total consumption was equal to their food poverty line – the “lower” non-food allowance. The second was the average amount spent for non-food items by those households whose food consumption was equal to their food poverty line – the “upper” non-food allowance. The *third* step consisted of adding to the food poverty lines the lower and upper non-food allowances to yield the lower and upper poverty lines for each of the 16 geographical areas.

<sup>9</sup> The sampling frame of 2005 HIES, based on the 2001 census, is likely to better reflect the current economic and demographic situation. Poverty lines based on this frame will yield better comparison with future poverty estimates since the same sampling frame will be also used for future surveys until the Census of 2011 becomes available.

Price indices for deflating the 2005 poverty lines to 2000 were derived by combining price information available in the HIES and Consumer Price Index (CPI). The HIES data provides price information and budget share of food items that account for more than half of total household expenditure, which was used to compute food price indices for each geographic area. Price indices for non-food items were taken from the urban and rural non-food component of the CPI.

Due to its similarity with earlier methods employed in Bangladesh, the selected method also yields a high degree of consistency with the results obtained from previously used poverty lines. The poverty trends obtained using *other methodological options* serve as important cross-checks for the robustness of poverty trends to the choice of particular poverty lines or methods. The results of this analysis, including the poverty estimates and trends derived from the method recommended by BBS, were endorsed by a Steering Committee set up by the government on August 13, 2006.<sup>10</sup>

## II. Methodologies for estimating growth elasticity of poverty

- **Regression method.** This method involves estimating  $\gamma$ ,  $\beta$ , and  $\delta$  from regressions using growth rates of stratum average poverty rates, per capita consumption expenditures, and Gini coefficients. Regression of the growth rate of poverty rates on the growth rates of per capita consumption expenditure and Gini coefficient provides  $\gamma$  (the gross elasticity of poverty to growth) and  $\beta$  (the elasticity of poverty to inequality). Regression of the growth rate of Gini coefficients on the growth rate of per capita consumption expenditures provides  $\delta$  (the elasticity of inequality to growth). To run the regressions, a database including poverty rates, Gini coefficients, and mean expenditures at the stratum level using HES 1991-92, HES 1995-96, HIES 2000, and HIES 2005 is constructed.
- **Bourguignon (2002)'s method.** This method estimates  $\gamma$  and  $\beta$  by assuming the distribution of per capita consumption expenditure is log normal. The assumption provides simple formula that derive both  $\gamma$  and  $\beta$  using basic statistics from the distribution of per capita expenditure.  $\delta$  (the elasticity of inequality to growth) is calculated by dividing the percentage change of an inequality measure (standard deviation of expenditure) by the percentage change of mean expenditure. For this analysis, only HIES 2005 data is used.
- **Datt-Ravallion (1992) method.** This method follows the well-known growth decomposition method. For this analysis, per capita expenditure data for 2000 and 2005 are used. This method first creates a hypothetical distribution of per capita expenditure as if the expenditure grew at the same rate among all households between 2000 and 2005. Since this hypothetical distribution of expenditure and the 2000 distribution share the same distributional properties, the difference in poverty rate between the two distributions can be attributed solely to economic growth between 2000 and 2005. On the other hand, since the hypothetical distribution and the 2005 distribution share the same mean expenditure, the difference in poverty rates can be attributed solely to a change in distribution/inequality between 2000 and 2005. Deriving the direct impact is trivial from the first comparison. The indirect impact is derived from dividing the percentage change in poverty rate from the second comparison by the percentage change in mean expenditure.

Each methodology has its pros and cons. The regression method assumes that the relationship among growth, poverty, and inequality at the national level can be estimated by the variations at

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<sup>10</sup> Chaired by the Planning Secretary, the meeting counted among its participants the Director General, BBS, Member GED, DG BIDS, Research Director BIDS, representatives from other government departments and Dhaka University, and the World Bank.

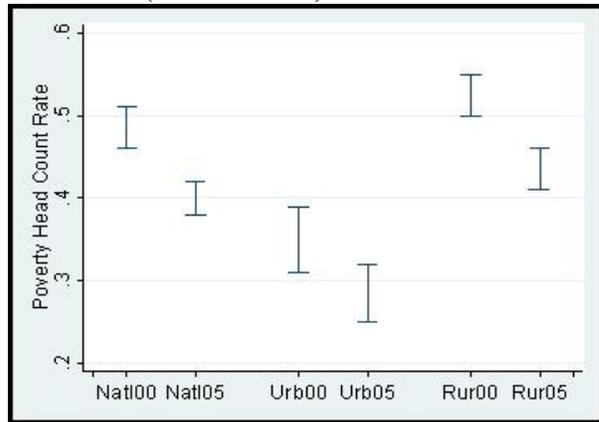
the stratum level and over time; however, there is no simple way to test the validity of this assumption. Also, small sample biases are inevitable: at most 48 observations are available for regressions (16 strata times 3 years – one year needs to be dropped due to the need to compute growth rates for all variables). On the other hand, since this method uses multi-year data, the growth elasticity tends to reflect a more stable and long-term relationship among growth, inequality, and poverty.

The validity of Bourguignon (2002)’s method hinges on the assumption that the distribution of per capita expenditure can be approximated by a log normal distribution. Bourguignon (2002) empirically tested this method for projection using a large cross-country data and found this method achieved fairly good accuracy.

In Datt-Ravallion (1992) method, the validity of the growth elasticity is subject to how closely the expenditure data from the select two surveys can predict the future relationship among growth, inequality and poverty, or more precisely, the elasticity of poverty to growth. If the selected two surveys were to reflect some extraordinary circumstances, the projection based on this method would be biased. This method however has a merit as well. Since distributional properties are highly multi-dimensional, the impact of a change in distribution is difficult to be measured by one aspect of distribution such as Gini coefficient or standard deviation. Datt-Ravallion method fully captures the distributional impact by comparing two distributions directly.

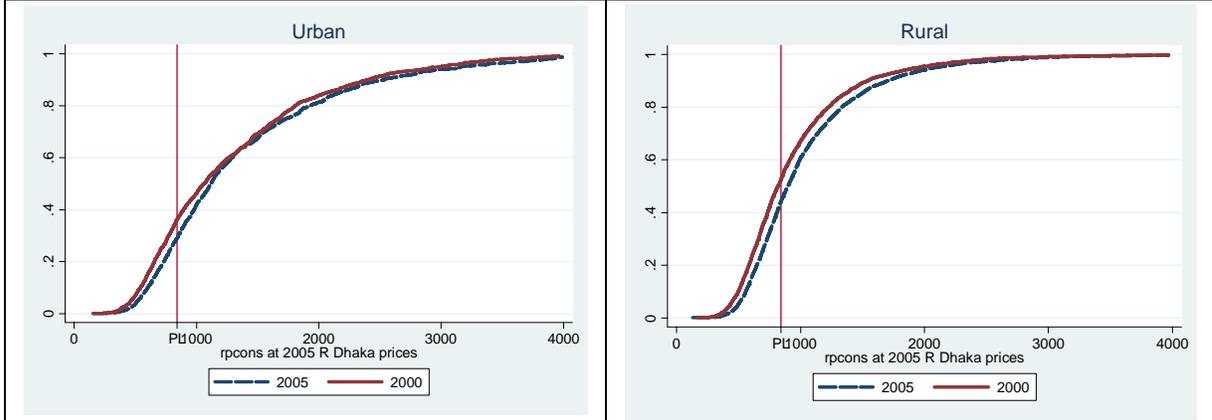
**III. Figures referred to in main text**

**Figure A-1.1: 95% Confidence Intervals for poverty headcounts (2000 and 2005)**



Source: HIES (2000 and 2005)

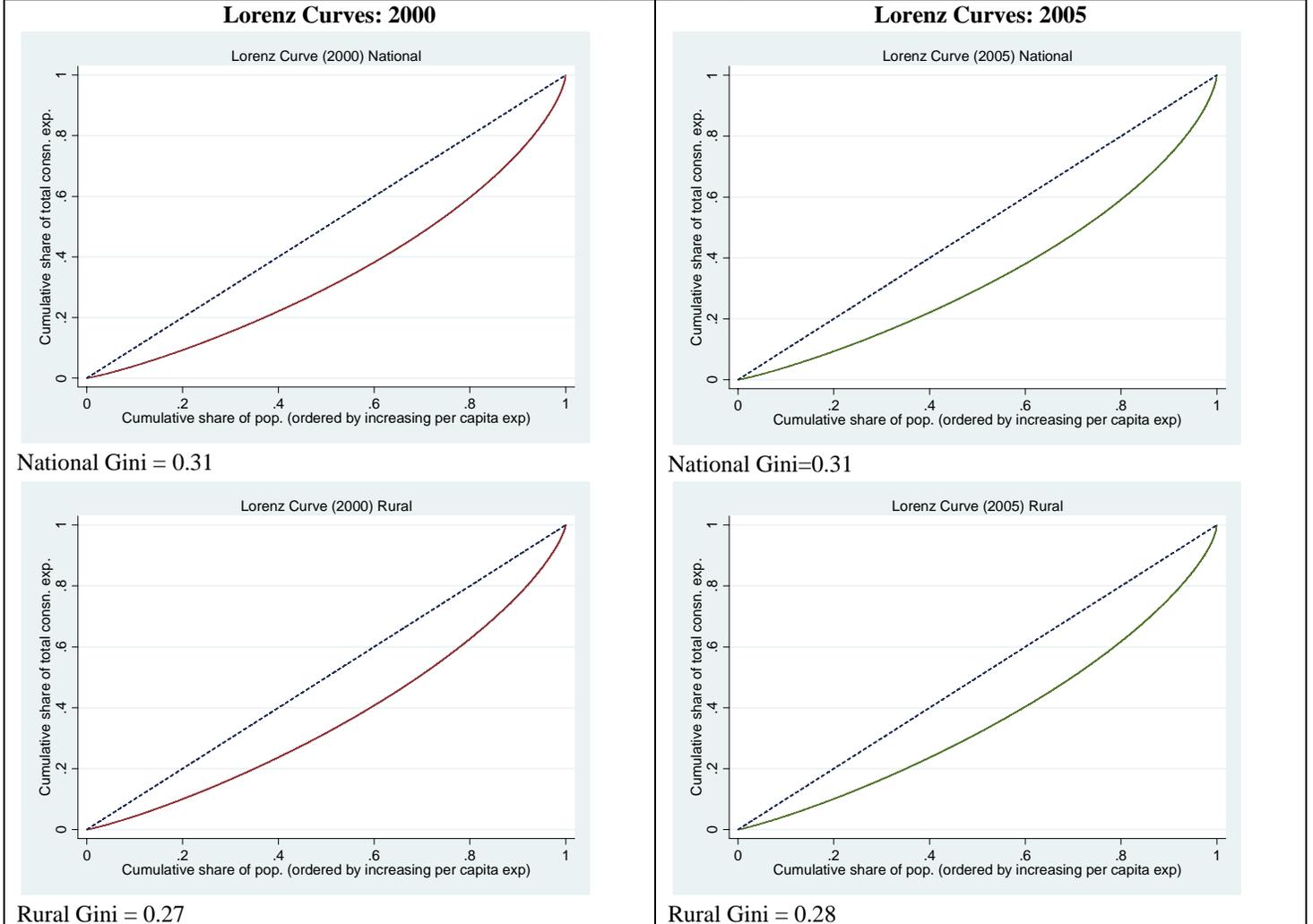
**Figure A-1.2: Cumulative distribution of expenditures for urban and rural areas**

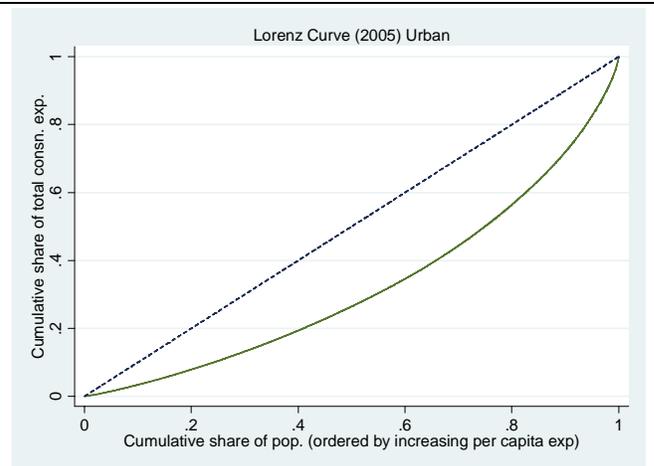
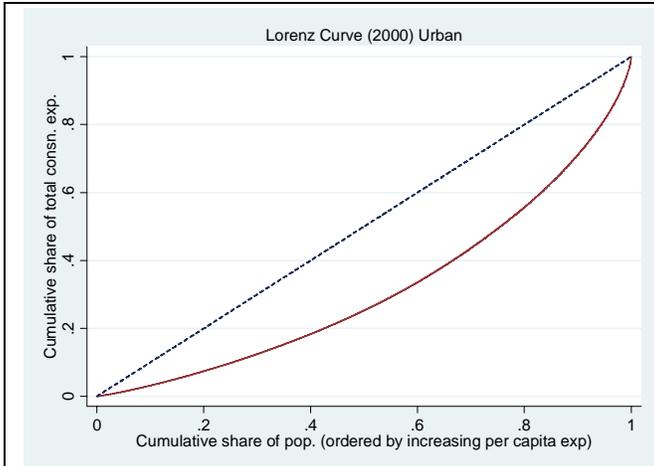


Source: HIES (2000 and 2005)

Note: The poverty rate is given by the Y-axis of the point where the cumulative distribution functions intersects the poverty line

**Figure A-1.3: Lorenz curves of per capita expenditures for 2000 and 2005**

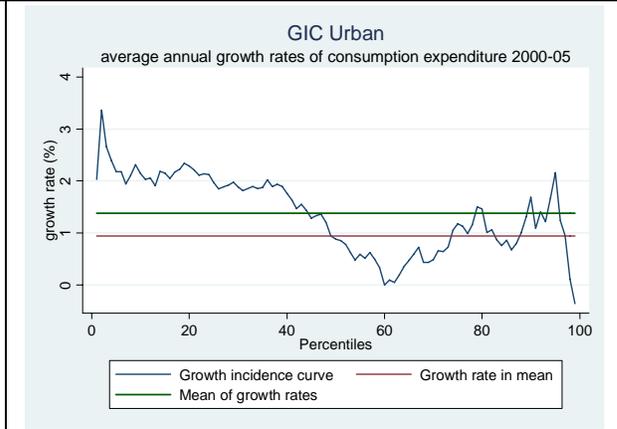
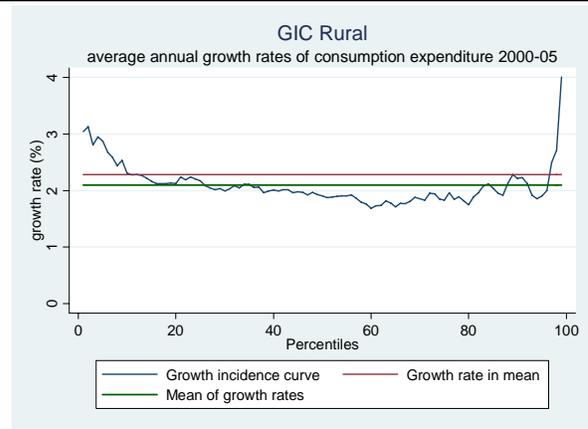




Urban Gini = 0.37

Urban Gini = 0.35

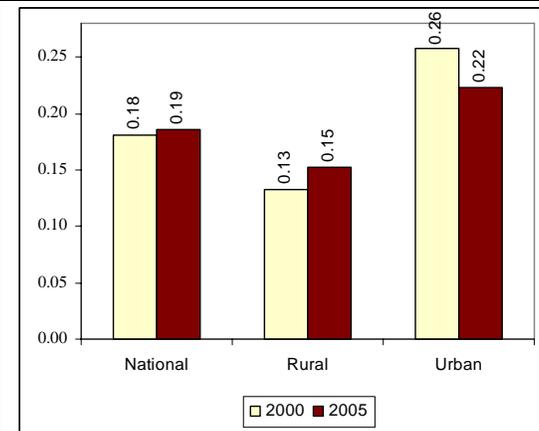
**Figure A-1.4: Growth Incidence Curves (2000-2005) – Rural and Urban**



Source: HIES (2000 and 2005)

Note: Growth is considered pro-poor if growth rate in mean < mean of growth rates, which is the case for urban areas.

**Figure A-1.5: Theil inequality indices for per capita real consumption expenditure**



Source: HIES (2000 and 2005)

**IV. Tables referred to in main text**

Year	Population*	Pov rate (%)		No. of poor	
		Upper PL	Lower PL	Upper PL	Lower PL
2000	126,000,000	48.9	34.3	61,563,600	43,205,400
2005	139,000,000	40.0	25.1	55,600,000	34,930,700

Source: HIES (2000, 2005)

Note: calculated as sum of population weights (=hhold weight\*hhold size) for each survey round

	1991/92	1995/96	2000	2005
<i>Upper Poverty Line</i>				
Rural	59.0	54.5	52.3	43.8
Urban	42.6	27.8	35.1	28.4
National	56.8	50.1	48.9	40.0
<i>Lower Poverty Line</i>				
Rural	44.0	39.4	37.9	28.6
Urban	23.6	13.7	19.9	14.6
National	41.3	35.1	34.3	25.1

Source: HIES (different rounds)  
 Note: Calculated using the Upper and Lower Poverty Lines of 2005, adjusted for price changes between years.

Division/Sector	Population share		Contribution to poverty reduction	
	2000	2005	Absolute/ percentage points	Percentage terms
Barisal	7.1		-0.1	0.9
Chittagong	20.1		-2.4	26.6
Dhaka	31.4		-4.6	52.4
Khulna	11.7		0.1	-0.8
Rajshahi	23.4		-1.3	14.5
Sylhet	6.4		-0.6	6.2
Total Intra-divisional effect			-8.8	99.8
Population-shift effect			0.0	-0.4
Interaction effect			-0.1	0.6
Rural	79.9	75.3	-6.8	76.5
Urban	20.1	24.7	-1.4	15.3
Total Intra-sectoral effect			-8.1	91.9
Population-shift effect			-0.8	9.0
Interaction effect			0.1	-0.9
Total change in poverty headcount			-8.9	100.0

Source: HIES (2000, 2005)

<b>Table A-1.4: Growth (%) in mean per capita real consumption (2000-2005)</b>					
<i>Divisions</i>	<i>rural</i>	<i>urban-muni</i>	<i>SMA</i>	<i>urban-all</i>	<i>Total</i>
Barisal	2.9	-3.2	..	-3.2	4.2
Chittagong	4.3	10.7	55.0	36.9	13.1
Dhaka	26.9	11.9	-1.7	0.6	16.7
Khulna	3.5	-3.5	-24.1	-12.1	1.2
Rajshahi	11.0	-14.6	48.4	-5.9	8.7
Sylhet	11.1	62.1	..	62.1	17.3
<i>Total</i>	<i>12.0</i>	<i>3.5</i>	<i>6.2</i>	<i>4.8</i>	<i>11.9</i>

Source: HIES (2000, 2005)

Note: Since the data is not representative below division level, these estimates may not be representative and subject to large standard errors