

*Spatial Dimensions of Income Inequality and Poverty
in Bangladesh: An Analysis of the 2005 Household
Income and Expenditure Survey Data*

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Spatial Dimensions of Income Inequality and Poverty in Bangladesh: An Analysis of the 2005 Household Income and Expenditure Survey Data

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Abstract

Using the 2005 Household Income and Expenditure Survey, this paper examined income inequality and poverty in Bangladesh with particular focus on their spatial dimensions. Since disparity among administrative divisions is small, inequalities within each administrative division, particularly urban inequality, need to be reduced. Since education appears to have played an important role in inequality, especially in urban areas, raising general educational level is essential. Since wages and salaries serve to have mitigated inequality, especially in urban areas, opportunities for formal income should be expanded. Though the effect may be small, transfer programs should be expanded to raise income among the poorest. In addition to raising general educational level, it is necessary to provide primary education throughout the country in order to mitigate poverty. It is imperative to raise agricultural productivity in both rural and urban sectors. Furthermore, non-agricultural activities should be promoted according to the pattern of comparative advantages.

Keywords: Income Inequality, Poverty, Spatial Dimensions, Theil Index, Gini Coefficient, FGT Index, Bangladesh

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Spatial Dimensions of Income Inequality and Poverty in Bangladesh: An Analysis of the 2005 Household Income and Expenditure Survey Data

I. Introduction

Bangladesh has achieved relatively high growth over the last two decades, during which its real GDP grew at an annual average rate of 5.2%. In 2010, its per capita GDP exceeded 650 US dollars. The Goldman Sachs identified Bangladesh as one of the most promising economies in the 21 century and classified it into the Next 11 countries, together with Indonesia, the Philippines, South Korea, Vietnam, etc, which could follow the four emerging BRIC economies. However, the incidence of poverty in Bangladesh is still very high among Asian countries, even though it has declined considerably over the last two decades owing to steady growth. According to the Progress Report on Millennium Development Goals (GoB and UN, 2005), almost half of Bangladeshis were living below US\$1 per day and the proportion of people in extreme poverty was 20% in 2005. In line with the Millennium Development Goals, the Bangladesh government is making an effort to achieve the target of reducing extreme poverty to 14% by 2015.

A number of factors have contributed to high incidence of poverty in Bangladesh, especially in rural areas. Adult illiteracy rate is very high at 60%. About 80% of active household members have no education or have attained only primary education. More than 40% of the labor force is in the agricultural sector, and many farmers are landless and engaged in subsistence farming. Only a quarter of paid non-agricultural workers are females, and female wage is less than half of male wage in the non-agricultural sector. Meanwhile, there is a large disparity in infrastructure between the rural and urban sectors. While 80% of urban households have access to electricity, only 30% of rural households have access to. Water supply conditions are even worse in rural areas; virtually no rural households have access to tapped water supply. Merely 9% of rural households live in houses with brick walls, though many of them own houses. Very poor socioeconomic conditions in rural areas seem to have aggravated poverty in

Bangladesh.

There have been a number of studies on inequality and poverty in Bangladesh; for example, Rahman and Huda (1992), Wodon (1997, 1999, and 2000), Khan (2001), Khandker (2005, and 2009), Klytchnikova and Diop (2006), Nath and Namun (2007), Shilpi (2008), Khandker, Bakht and Koolwal (2009), Khandker, Khalily and Samad (2010), and Kotikula, Narayan and Zaman (2010). But only a few studies have analyzed inequality and poverty specifically in a spatial context. According to Eastwood and Lipton (2000) and Shorrocks and Wan (2005), the urban sector has much larger mean per capita income/expenditure than the rural sector and the urban-rural disparity accounts for around 10-20% of overall income/expenditure inequality in most Asian countries. The urban sector also has larger income/expenditure inequality than the rural sector. On the other hand, poverty is more a rural than an urban phenomenon in the developing world, as rural poverty headcount ratio is appreciably higher than urban, and about three quarters of poor people live in rural areas using the \$1 a day poverty line (Ravallion, Chen, Sangraula, 2007). In many developing countries, the incidence of poverty varies from region to region.

Bangladesh is a large country with the population of 140 million and the land area of 148 thousand square km, extending 820 km north to south and 600 km east to west. It is bordered mostly by India, and the southern part of Bangladesh faces the Bay of Bengal. In 2010, the country is divided into 7 administrative divisions, and these divisions are further divided into 64 districts. In terms of socioeconomic conditions and physical and human geography, there are large differences between regions and between rural and urban areas. In order to formulate better policies to promote sustainable and equitable development, it is imperative to examine inequality and poverty in a spatial context. The main objective of this paper is to investigate income inequality and poverty in Bangladesh based on the 2005 Household Income and Expenditure Survey (HIES), with particular focus on their spatial dimensions (i.e., rural versus urban sectors and regions). This is achieved by conducting several inequality and poverty decomposition analyses by location and region based on the Theil indices, the Gini coefficient, and the Foster-Greer-Thorbecke indices.

II. The Data and Method

Data

This study uses income data from the Household Income and Expenditure Survey (HIES) in 2005 to analyze the distribution of economic well-being in Bangladesh. The HIES has been conducted almost every 5 years since 1973-74 to collect socio-economic information at the household level. The original 2005 HIES dataset includes 10,080 households (504 primary sampling units times 20 households); but due to missing values, 684 households are eliminated from the dataset in this study, and thus we analyze the economic well-being of 9,396 households, of which 5,646 are in rural areas and 3,750 are in urban areas (BBS, 2007). This study measures inequality among these 9,396 households in annual per capita household income (in Bangladesh Taka or BDT).

On the other hand, to measure poverty, this study uses individual level data, where we assume that household income is shared equally by the household members, i.e., each member receives its household's per capita income. Our dataset includes 48,543 individuals. The poor are those individuals whose per capita household income falls below a poverty line. In Bangladesh, poverty lines have been estimated based on the cost of basic needs, in which the cost of a basket of 11 food items, required to meet 2,122 calories per day, was estimated for urban and rural areas in each administrative division using regional price data, as recommended by Ravallion and Sen (1996). Lower poverty lines, used in this study, correspond to this cost (i.e., food poverty lines).

In 2005, Bangladesh was divided into 6 administrative divisions: Barishal, Chittagong, Dhaka, Khulna, Rajshahi, and Sylhet. Table 1 presents the geographical distribution of households in the 2005 sample. Dhaka has the largest number of households in the sample, which is followed by Rajshahi and Chittagong. Dhaka is most urbanized with the urbanization rate of 44%, which is followed by Chittagong and Khulna at 42.5% and 42.3%, respectively, while Barishal is least urbanized with the urbanization rate of 31.9%. Chittagong and Sylhet have the largest household size at 5.5 persons per household, while Rajshahi has the lowest size at 4.6 persons per household.

Table 1

Since this study explores the factors of income inequality in the distribution of households, the active working member of a household having the highest education among the active members is assumed to represent the household, rather than the head of the household, who is the decision-maker of the household and usually the eldest member, where active working members are considered as those members who are engaged in some sorts of income generating activities. The active working member representing a household may be the household head as well.

Household income is the sum of the earnings of all household members, either in cash or in kind. There are several sources of household income. The 2005 HIES dataset provides the 8 sources: (1) *Agro income* is an income generated from all agricultural products including farm, fishery and forestry products; (2) *Formal income* includes wages and salaries earned from various permanent and temporary jobs in farm and non-farm activities; (3) *Business income* includes profits earned in various entrepreneurial activities; (4) *Rental income* is an income generated by renting land, real estate or other establishments excluding agricultural equipments; (5) *Remittance income* encompasses remittance from within the country and abroad; (6) *Retirement income* includes pension, gratuity and other benefits after retirement; (7) *Transfer income* includes all direct and indirect transfers and gifts in cash or in kind, including transfers in social safety net programs, education benefits, and prize in lottery; and (8) *Miscellaneous income* includes all other incomes such as interest and dividend incomes.

Method

Inequality Measures

Suppose that there are n households in a population, which are classified into m mutually exclusive and collectively exhaustive groups according to a certain categorical variable, such as location (e.g., urban and rural sectors, provinces, regions), gender, age, education, occupation, sector, household size, etc. Let μ , n_i , μ_i , and y_{ij} be the mean per capita income of all households, the number of households in group i , the mean per capita income of households in group i , and the per capita income of household j in group i , respectively. Overall inequality in per capita household income is then measured by the Theil indices T and L as follows (Anand, 1983; Fields, 2001):

$$T = \frac{1}{n} \sum_{i=1}^m \sum_{j=1}^{n_i} \left(\frac{y_{ij}}{\mu} \right) \log \left(\frac{y_{ij}}{\mu} \right) \quad (1)$$

$$L = \frac{1}{n} \sum_{i=1}^m \sum_{j=1}^{n_i} \log \left(\frac{\mu}{y_{ij}} \right) \quad (2)$$

These Theil indices belong to the generalized entropy class of inequality measures and satisfy several desirable properties as a measure of inequality: anonymity; income homogeneity; population homogeneity; and the Pigue-Dalton principle of transfers. Furthermore, they can be additively decomposed into the within-group inequality component and the between-group inequality component as follows (Shorrocks, 1980):

$$T = \sum_{i=1}^m \left(\frac{n_i \mu_i}{n \mu} \right) T_i + \sum_{i=1}^m \left(\frac{n_i \mu_i}{n \mu} \right) \log \left(\frac{\mu_i}{\mu} \right) = T_W + T_B \quad (3)$$

$$L = \sum_{i=1}^m \left(\frac{n_i}{n} \right) L_i + \sum_{i=1}^m \left(\frac{n_i}{n} \right) \log \left(\frac{\mu}{\mu_i} \right) = L_W + L_B \quad (4)$$

where T_i and L_i are, respectively, the Theil indices T and L for the within-group inequality of group i .

This study also uses the Gini coefficient to estimate inequalities in per capita household income. Suppose that all households are arranged in non-descending order of per capita household income, i.e., $y_1 \leq y_2 \leq \dots \leq y_n$, where y_i is the per capita income of i th household. Then the Gini coefficient for the distribution of per capita household income, $\mathbf{y} = (y_1, y_2, \dots, y_n)$, can be given by:

$$G = \frac{2}{n\mu} \text{cov}(i(\mathbf{y}), \mathbf{y}) \quad (5)$$

where $i(\mathbf{y})$ is the rank of households in the distribution of per capita household income. It should be noted that the Gini coefficient satisfies the above mentioned four desirable properties.

Suppose now that the per capita income of i th household is composed of K income sources as follows:

$$y_i = y_{i1} + y_{i2} + \dots + y_{Ki} \quad \text{and} \quad \mu = \mu_1 + \mu_2 + \dots + \mu_K \quad i = 1, 2, \dots, n.$$

Then the Gini coefficient can be additively decomposed by income sources as follows (Pyatt, Chen and Fei, 1980; Lerman and Yitzhaki, 1985):

$$G = \sum_{k=1}^K w_k C_k = \sum_{k=1}^K w_k R_k G_k \quad (6)$$

In this formula, w_k is the share of income from source k and $C_k = \frac{2}{n\mu_k} \text{cov}(i(\mathbf{y}), \mathbf{y}_k)$,

$G_k = \frac{2}{n\mu_k} \text{cov}(i(\mathbf{y}_k), \mathbf{y}_k)$, and $R_k = \frac{\text{cov}(i(\mathbf{y}), \mathbf{y}_k)}{\text{cov}(i(\mathbf{y}_k), \mathbf{y}_k)}$ are, respectively, the concentration

ratio, the Gini coefficient, and the rank correlation ratio for income source k , where $\mathbf{y}_k = (y_{k1}, y_{k2}, \dots, y_{kn})$ is the distribution of per capita household income from source k and $i(\mathbf{y}_k)$ is the rank of households in the distribution of per capita household income from source k .

In equation (6), if we let $g_k = \frac{C_k}{G} = \frac{R_k G_k}{G}$, then we have

$$1 = \sum_{k=1}^K w_k g_k \quad (7)$$

g_k is called the relative concentration ratio of income source k . If $g_k > 1$, then income source k is an inequality-increasing component, while if $g_k < 1$, then income source k is an inequality-decreasing component.

Poverty Measures

This paper uses the P_α class of poverty measures, which was devised by Foster, Greer and Thorbecke (1984) and thus known as the FGT indices, to measure the level of poverty. Let n , q , z , α , and y_i be the number of people, the number of poor people, the poverty line, the parameter of poverty aversion, which measures the sensitivity to poverty, and the per capita household income of individual i , where we assume that each individual receives its per capita household income. Then, the P_α class of poverty measures is defined by:

$$P_\alpha = \frac{1}{n} \sum_{i=1}^q \left(\frac{z - y_i}{z} \right)^\alpha \quad (8)$$

where $y_i < z$ for $i = 1, 2, \dots, q$. When $\alpha = 0, 1, \text{ and } 2$, equation (8) becomes,

respectively, $P_0 = \frac{q}{n}$, $P_1 = \frac{q}{n} \bar{I}$ and $P_2 = \frac{q}{n} (\bar{I}^2 + (1 - \bar{I})^2 C_p^2)$. $\bar{I} = \frac{z - \bar{y}_p}{z}$ is the average (normalized) income shortfall among the poor, where $\bar{y}_p = \frac{1}{q} \sum_{i=1}^q y_i$ is the average income of the poor, while $C_p^2 = \frac{1}{\bar{y}_p^2} \frac{1}{q} \sum_{i=1}^q (y_i - \bar{y}_p)^2$ is the squared coefficient of variation among the poor. P_0 , P_1 , and P_2 are called, respectively, the poverty head count ratio, the poverty gap index, and the poverty severity index. All these indices satisfy the principles of anonymity and population homogeneity. Furthermore, the poverty gap index satisfies the principle of strong monotonicity, while the poverty severity index satisfies the principle of distributional sensitivity in addition to strong monotonicity.

The P_α class of poverty measures is subgroup decomposable. Suppose that the population is divided into m mutually exclusive and collectively exhaustive groups. Let P_α^j and v_j are, respectively, the poverty of group j , as measured by the P_α indices, and the population share of group j . Then, overall poverty can be express as a sum of contributions from these groups as follows:

$$P_\alpha = \sum_{j=1}^m v_j P_\alpha^j \quad \text{or} \quad 1 = \sum_{j=1}^m \frac{v_j P_\alpha^j}{P_\alpha} \quad (9)$$

$\frac{v_j P_\alpha^j}{P_\alpha}$ is the % contribution of group j to overall poverty. When $\alpha = 0$ (i.e., headcount ratio), it is the % share of group j in poor population.

III. Empirical Results

Accounting for Overall Income Inequality

Rural and Urban Dimensions

Table 2 presents the result of inequality decomposition by location (urban vs. rural sectors). Overall inequality in per capita household income is 0.741 as measured by the Theil index T, while according to the Theil L and the Gini coefficient, it is 0.469 and 0.504, respectively. A very large Theil T value, as compared to the values of the Theil L

and the Gini coefficient, indicates that there are some exceptionally rich households in the sample, since in the case of the Theil T, each household is weighted by its income share.

Table 2

When measured by the Theil L and the Gini coefficient, the urban sector has a larger inequality than the rural sector; but when measured by the Theil T, this is reversed. This indicates that the Lorenz curves for the urban and rural sectors cross. Figure 1 depicts the Lorenz curves based on percentile group data. It shows that the rural curve is located mostly above the urban curve. The question is why, according to the Theil T, the urban sector has a smaller inequality than the rural sector.

Figure 1

According to the percentile group data, the two Lorenz curves, in fact, cross somewhere between the 8th and 9th percentile groups, i.e., urban sector's Lorenz curve is located above rural sector's curve up to the 8th percentile group. This, however, should not be the main reason why urban Theil T is smaller than rural Theil T, since the Theil T uses an income share as weight when each household's per capita income is compared to the mean per capita income of all households; very poor households are weighted by income shares that are much smaller than population shares.

It should be noted that the richest 1% households (i.e., 100th percentile group) account for 18% of total per capita household income, suggesting that there is a very large income disparity between the richest 1% households and the other households. According to the Theil T, the disparity between these two groups is 0.36, accounting for almost 50% of overall inequality (0.741). The within-group inequality of the richest 1% households is also very large at 0.76, contributing 18% to overall inequality. This indicates that a few exceptionally rich households exist in the richest 1% group.

Using the richest 1% households (22 rural and 71 urban households in the sample), the inequality is decomposed by location. The result is presented in Table 3. Interestingly, among the richest 1% households, the rural sector has a much higher

inequality than the urban sector according to all inequality indices (i.e., the Gini coefficient and the Theil indices). Rural sector's very high inequality in the richest 1% group appears to be the main factor that raised its within-sector inequality among all households, which, according to the Theil T, exceeds urban sector's inequality (0.730 vs. 0.709).

Table 3

In the richest 1% group, three households, one in urban Rajshahi and two in rural Khulna and rural Rajshahi, have exceptionally large per capita incomes. Their per capita household incomes are about 200 times as large as the mean per capita income of all households. Even among the richest 1% households, their incomes are more than 10 times as large as the mean. These three very rich households appear to have raised overall inequality radically and would mask the true determinants of income inequalities for the majority of households. Therefore, this study excludes these three households from the sample.

After excluding the three exceptionally rich households, the result of inequality decomposition by location is given in Table 4. Overall inequality is reduced substantially to 0.484 (from 0.741) according to the Theil T. Urban sector's mean per capita household income is 1.6 times as large as rural sector's mean income. Since the urban-to-rural ratio is not large, the between-sector inequality, at 0.027, accounts for only 5.5% of overall inequality. Without the three rich households, the urban sector has a significantly larger within-sector inequality than the rural sector (0.530 vs. 0.381); Based on the bootstrap standard error for the Theil index T, the 95% confidence interval is 0.32-0.44 for the rural sector and 0.45-0.61 for the urban sector. Urban inequality's contribution to overall inequality amounts to 56.2%, while rural inequality's contribution is 38.3%. In 2005, urbanization rate is 39.9%. Further urbanization would make urban inequality more prominent in overall inequality.

Table 4

Regional Dimension

Table 5 presents the result of inequality decomposition by administrative division (i.e., region). Disparity among administrative divisions is very small. The largest mean per capita household income is registered by Sylhet, while the smallest by Rajshahi; the ratio of the largest to the smallest is about 1.4. According to the Theil T, the between-division inequality is 0.007, accounting for merely 1.5% of overall inequality. In other words, much of the income inequality among households is due to within-region inequalities.

Though Dhaka has the second highest within-region inequality as measured by the Theil T, its income share is the largest and thus it offers the largest contribution to overall inequality at 33%. Chittagong has the highest within-region inequality by the Theil T and its contribution to overall inequality amounts to 24%, even though its population share at 18% is the third largest. While Rajshahi has the second largest population share at 26%, its mean per capita income is the smallest, and thus its contribution to overall inequality is 16% by the Theil T.

Table 5

Table 6 presents inequality decomposition by location for each administrative division (region). The contribution of the between-sector inequality to total within-division inequality varies from division to division. But, 5 out of 6 administrative divisions, it is smaller than 10%, signifying that much of within-division inequality is due to within-sector inequalities for most administrative divisions. Rajshahi has the smallest urban-to-rural ratio in mean per capita income at 1.2; thus its between-sector inequality accounts for merely 1.5% of Rajshahi's total inequality. Its urban mean per capita income at less than 18,000 is, in fact, the smallest among all administrative divisions. It should be noted that in Rajshahi, 20% of its urban households are still engaged in agriculture as their main income-generating job, which is the biggest among all administrative divisions, and only 20% of its urban households have secondary and higher education, which is the lowest.

Khulna has the second smallest urban-to-rural ratio at 1.4, and the between-sector inequality accounts for 3% of Khulna's total inequality. Chittagong, Dhaka and Barishal

follow next with the urban-to-rural ratio of around 1.7, and the contribution of the between-sector inequality amounts to 5.4%, 7.1%, and 8.9%, respectively. Interestingly, in Barishal, about three quarters of its active working members representing urban households have primary and higher education, while in the other divisions, the proportion is less than 60%. Sylhet is exceptional among 6 divisions, as its urban-to-rural ratio is very large at 2.4, and thus the between-sector inequality accounts for 20% of Sylhet's total inequality. While its rural mean per capita income is little above 15,000, its urban mean per capita income is very high at around 37,000. In Sylhet, 93% of urban households are engaged in non-agricultural activities as their main income-generating jobs; the proportion is, in fact, the largest among all divisions. On the other hand, almost 70% of rural households are in the no-education group, and this proportion is the largest among all divisions.

In all administrative divisions, urban inequality is higher than rural inequality; thus further urbanization would increase inequality within each division, *ceteris paribus*. The contribution of urban inequality varies from division to division; it ranges from 46% in Rajshahi to 64% in Chittagong. Rajshahi not only has the smallest urban-to-rural ratio in mean per capita income but also has the smallest urban inequality, accounting for 46% of Rajshahi's total inequality. This is due mainly to its relatively large agricultural share in the urban sector. On the other hand, Chittagong has the highest urban inequality, accounting for 64% of its total inequality. It should be noted that in urban Chittagong, there are a few very rich households, whose main income source is income from entrepreneurial activities. This seems to have raised urban inequality to a considerable extent. Dhaka, most urbanized division, registers the second highest urban inequality, accounting for 55% of its total inequality. In Dhaka, more than 90% of its urban households are engaged in non-agricultural activities as their main income-generating jobs.

The contribution of rural inequality ranges from 31% in Chittagong to 52% in Rajshahi. However, Barishal has the smallest rural inequality, which is followed by Rajshahi and Sylhet, while Dhaka has the largest rural inequality, followed by Chittagong. Barishal not only has the smallest rural inequality but also the smallest mean rural per capita income. There seems to be a positive relationship between rural inequality and rural mean per capita income. It is interesting to note that even though

rural inequality is relatively small in Rajshahi, its contribution exceeds 50%, which is the largest among all divisions.

Table 6

Accounting for Rural and Urban Inequalities

Distribution of Households according to Household Attributes

In order to explore the determinants of rural and urban inequalities, it is instructive to analyze the distribution of households by gender, age, household size, education, and agriculture and non-agriculture sectors. Table 7 presents these distributions. First, there is no notable difference in the gender distribution between the rural and urban sectors: around 83-85% of households are represented by male active workers. Second, 76% of households are represented by an active worker aged between 21 and 50 in the urban sector, while in the rural sector, the proportion is 70%. However, the rural and urban sectors are not very different in terms of the average age of active workers (39.1 and 38.4, respectively). Third, the rural sector has a slightly larger average household size than the urban sector. 55% of households have a household size at least 4 persons in the rural sector, while the proportion is 50% in the urban sector.

Fourth, there is a conspicuous difference between the rural and urban sectors in the distribution of households by the educational attainment of the active working member representing its household. 57% of households are in the no-education group in the rural sector, while in the urban sector, the proportion is much smaller at 42%. On the other hand, 26% of households are in the secondary and higher education group in the urban sector, while in the rural sector, the proportion is 12%. Fifth, there is also a notable difference in the distribution of households with respect to agriculture versus non-agriculture sector. In the rural sector, about half of households are in agriculture; but only 14% in the urban sector.

Table 7

Inequality Decomposition by Population Sub-group

Table 8 provides the results of inequality decomposition by gender, age, education and sector (agriculture/non-agriculture) based on the Theil T in the rural and urban sectors. As to gender and age, the between-group inequality is negligible, accounting for less than 1% of rural and urban inequalities. In the rural sector, households represented by a male active worker have a higher within-group inequality than female represented households by both the Theil T and the Gini coefficient. But, in the urban sector, the result is mixed depending on the Theil T and the Gini. Interestingly, female represented households have a larger mean per capita income than male represented households in both rural and urban sectors. In the rural sector, households represented by an active working member aged 51-60 have the largest within-group inequality. They also have the highest mean per capita income. In the urban sector, however, households represented by an active working member aged 31-40 have the largest within-group inequality, though their mean per capita income is not the largest. The largest mean per capita income is registered by households represented by an active working member aged 41-50 and 51-60.

The between-group inequality is relatively large in the decomposition by education, accounting for 4.7% and 11.1%, respectively, of rural and urban inequalities. In the rural sector, households represented by an active working member with secondary and higher education have 1.7 times as large mean per capita income as those with no education, whereas in the urban sector, the ratio is 2.3. No-education group's inequality accounts for more than half of rural inequality, while the secondary and higher education group has the largest contribution to urban inequality at 37%. In the decomposition by sector (agriculture/non-agriculture), the between-group inequality is very small in both rural and urban sectors, though not negligible. In the urban sector, households represented by an active working member engaged in non-agricultural activities have 1.6 times as large mean per capita income as those in agriculture. But the ratio is 1.2 in the rural sector. Interestingly, households in the agriculture group have a higher within-group inequality than those in non-agriculture in the rural sector.

Table 8

Inequality Decomposition by Income Sources

Table 9 presents inequality decomposition by income sources in the rural and urban sectors. In the rural sector, 35.7% of total income is generated by agricultural activities. Formal income (wages and salaries) and business income follow next by accounting for, respectively, 25.5% and 16.5% of total income. Among these three income sources, business income serves to have raised inequality in per capita household income among rural households, while the other two sources serve to have lowered inequality, as indicated by relative concentration ratio. Though the share is very small, retirement income is an inequality-increasing source, while transfer income serves to have lowered inequality. Remittance income and rental income are both inequality-increasing sources, thus they contribute 11.3% and 4.7% to rural inequality, respectively, which are larger than their income shares.

In the urban sector, formal income (wages and salaries) accounts for 39.1% of total income, which is followed by business income with the share of 33.1%. Like in the rural sector, business income serves to have raised urban inequality, while formal income serves to have lowered urban inequality. Therefore, the contribution of business income to urban inequality amounts to 43.7%, which is much larger than its income share. On the other hand, formal income accounts for 29.9% of urban inequality, much smaller than its income share. Among the other income sources, income from agricultural activities and transfer income are inequality-reducing sources, while retirement income and rental income are inequality-increasing sources.

Formal income (wages and salaries) from farm and non-farm activities appears to play an important role in mitigating income inequality in both rural and urban sectors. Though the magnitude is very small, transfer incomes, such as transfers in social safety net programs, also serve to have alleviated rural and urban inequalities. On the other hand, business income, i.e., profits from entrepreneurial activities, serves to have raised inequality in both rural and urban sectors. Especially, it plays a decisive role in urban inequality. In order to reduce income inequality, it is apparent that opportunities for formal income (wages and salaries) from farm and non-farm activities should be expanded in both rural and urban sector. At the same time, transfer programs, such as

social safety net programs, should be expanded to raise transfer incomes, particularly in lower income classes.

Table 9

Accounting for Overall Poverty

Rural and Urban Dimensions

Table 10 presents the level of poverty by location (rural and urban sectors), as measured by the FGT indices. The rural sector accounts for 71.5% of poor population, which is larger than its population share of 61.2%, since the rural sector has a much higher incidence of poverty (i.e., higher poverty headcount ratio) than the urban sector: 35.5% of people are under the poverty line in the rural sector, compared to 22.4% in the urban sector. Rural poverty is also deeper than urban poverty, as shown by the average income shortfall (I): average income among the poor is 35.5% smaller than the poverty line in the rural sector, while in the urban sector, it is 31.5%. In other words, it would be more expensive on average to remove poverty in the rural sector than in the urban sector. Furthermore, rural poverty is severer than urban poverty, since inequality among the poor (C^2) is higher in the rural than in the urban sector, indicating that very poor people exist in the rural sector. Due to its larger average income shortfall and inequality among the poor, rural sector's contribution to overall poverty is 75.3% as measured by the poverty severity index (P_2), which is even larger than its share of poor population (71.5%).

Table 10

Regional Dimension

Table 11 provides the level of poverty by administrative division (region). Barishal has the highest head count ratio; 37.4% of its people are under the poverty line. Rajshahi, Chittagong and Dhaka follow next, but their head count ratios are much smaller at around 0.30. On the other hand, Sylhet has the lowest head count ratio; 23.6% of its people are under the poverty line. Due to its large population share, Dhaka accounts for 28.4% of the poor in the nation; Rajshahi and Chittagong come next with 23.9% and 20.3%, respectively. Barishal, despite its high headcount ratio, contributes 10.1% to

overall poverty due to its small population share.

Poverty in Barishal and Dhaka is very deep as they have a very large average income shortfall (I); in these two divisions, average income among the poor is about 37% smaller than the poverty line. Furthermore, Dhaka has a very high inequality among the poor, indicating that there are very poor people in this division. Due to its large average income shortfall and inequality among the poor, Dhaka's contribution to overall poverty is 33.4% as measured by the poverty severity index (P_2), which is much larger than its share of poor population (28.4%). On the other hand, due to its low average income shortfall and inequality among the poor, Khulna's contribution to overall poverty is merely 8.4% as measured by the poverty severity index (P_2), which is much smaller than its share of poor population (13.0%).

Table 11

Table 12 shows the level of poverty by administrative division (region) in the rural and urban sectors. In the rural sector, Barishal has the biggest headcount ratio; 43.3% of its rural people are under the poverty line. Rural Dhaka comes next with the headcount ratio of 0.391. Due to its large population share, rural Dhaka accounts for 21.3% of overall poverty, as measured by the headcount ratio, i.e., 21.3% of poor people are located in rural Dhaka. In both rural Barishal and rural Dhaka, average income shortfall and inequality among the poor are also very high, indicating that poverty is deep and severe in these two rural areas. Rural Chittagong also has a relatively large headcount ratio, average income shortfall and inequality among the poor, though the levels are slightly lower than in rural Barishal and rural Dhaka. In the other administrative divisions (Khulna, Rajshahi, and Sylhet), the head count ratio is relatively small in the rural sector; but, about 30-32% of their rural population are still under the poverty line. It should be noted that rural Chittagong, rural Dhaka and rural Rajshahi together account for more than half of poor population, much greater than their combined population share of 42%.

The urban sector exhibits a quite different spatial pattern of poverty incidence. In the urban sector, Rajshahi has the biggest poverty headcount ratio; 28.4% of its urban people are under the poverty line, which is, in fact, slightly smaller than its rural sector's

headcount ratio, meaning that in Rajshahi, poverty is not only a rural problem but also an urban problem. Urban Barishal, urban Khulna and urban Chittagong follow with the headcount ratio of 0.252, 0.238 and 0.229, respectively. On the other hand, Dhaka has a relatively small headcount ratio in the urban sector; only 18% of its urban population are under the poverty line, which is in contrast to 39.1% in the rural sector. However, urban Dhaka has a relatively large average income shortfall and inequality among the poor, signifying that poverty is deep and severe in urban Dhaka despite its small incidence of poverty. Like in the rural sector, urban Sylhet registers the smallest headcount ratio; merely 10% of its people are under the poverty line. Urban Sylhet also has the lowest average income shortfall and inequality among the poor; the average income among the poor is 24% smaller than the poverty line, and the incomes are concentrated around this average income in urban Sylhet.

Table 12

Accounting for Rural and Urban Poverty

In this subsection, we analyze poverty level of individuals in relation to the attribute of the active working member who represents a household they belong to, since each household member has the same per capita income. Table 13 presents the level of poverty by the following attributes in the rural and urban sectors: gender, age, education and sector (agriculture/non-agriculture). In both rural and urban sectors, the male-represented household group has a larger headcount ratio than the female-represented household group. But, the difference is much more pronounced in the rural sector; in the rural sector, 37.9% of male-represented household members are under the poverty line, as compared to 25.8% in the female-represented group. Rural sector's male-represented group accounts for 64.2% of the poor in the nation, which is much larger than its population share of 52%. Poverty in the male-represented household group is also deep and severe in the rural sector, as the group has a very large average income shortfall and inequality among the poor; the average income is 36% smaller than the poverty line.

In the rural sector, the group of people whose households are represented by an active working member aged 31-40 has the largest headcount ratio. But, the 41-50 year

old group has almost the same level of poverty. In these two groups, more than 40% of the population are under the poverty line; they together account for 42% of the poor in the nation, which is much larger than their combined population share of 30%. Poverty in the 41-50 year old group is also very deep and severe in the rural sector, as the group registers a very large average income shortfall and inequality among the poor; the average income among the poor is 38% smaller than the poverty line. Though much smaller than these two groups, the 51-60 year old group and the 61+ group have a relatively high head count ratio in the rural sector, at around 0.32. Like in the rural sector, the 31-40 year old group has the highest headcount ratio in the urban sector, though its poverty level is much smaller than in the rural sector; 25% of its people are under the poverty line.

In both rural and urban sectors, the highest headcount ratio is registered by the no-education group, which is followed by the primary education and secondary and higher education groups. In the rural sector, the no-education group has a very large headcount ratio; 42.5% of its people are under the poverty line. The group also registers a relatively high headcount ratio in the urban sector, which is, in fact, bigger than the headcount ratio of rural sector's primary education group. The no-education group in the rural and urban sectors together accounts for about 64% of the poor in the nation, which is compared to its population share of 50%. It is interesting to note that the depth of poverty is very similar among the three educational groups in both rural and urban sectors; in the rural sector, the average income among the poor is around 35-36% smaller than the poverty line, while in the urban sector, it is 30-31%.

In both rural and urban sectors, the agriculture group has a very large headcount ratio; in the rural sector, 44.1% of its people are under the poverty line, while in the urban sector, the proportion is 41.1%. The agriculture group in the rural and urban sectors together account for a half of the poor in the nation, which is much larger than its population share of 35%. Poverty in the agriculture group is also very deep and severe, as the group has a very large average income shortfall and inequality among the poor; the average income among the poor is 38-39% smaller than the poverty line and the squared coefficient of variation is around 0.17. It should be noted that 58% of people in the agriculture group do not have any education in the rural sector, as

compared to 52% in the non-agriculture group. In the urban sector, the proportions are 50% and 40%, respectively, in the agriculture and non-agriculture groups.

Table 13

IV. Concluding Remarks

This paper has attempted to analyze income inequality and poverty in Bangladesh based on the 2005 Household Income and Expenditure Survey (HIES), with particular focus on their spatial dimensions (i.e., rural versus urban sectors and regions). Major findings are summarized as follows. Disparity between the rural and urban sectors is not large, accounting for around 6% of overall income inequality. The urban sector has a significantly larger within-sector inequality than the rural sector; its contribution to overall inequality amounts to 56% by the Theil T. Disparity among administrative divisions (regions) is very small, and thus much of the income inequality among households is due to within-division inequalities. Dhaka and Chittagong, first and third populous divisions, respectively, have relatively high within-division inequalities; they together account for around 55% of overall inequality. Rajshahi, second populous division, on the other hand, has the smallest within-division inequality.

In most administrative divisions, much of within-division inequality is due to within-sector inequalities (i.e., urban and rural inequalities). Sylhet is an exception; its between-sector inequality accounts for 20% of its within-division inequality. In all administrative divisions, urban inequality is larger than rural inequality; thus further urbanization would raise within-division inequality, *ceteris paribus*. Chittagong has the highest urban inequality, accounting for 64% of its within-division inequality. Dhaka, most urbanized division, registers the second highest urban inequality, where more than 90% of urban households are engaged in non-agricultural activities as their main income-generating jobs. On the other hand, Rajshahi not only has the smallest urban-to-rural ratio in mean per capita income but also the smallest urban inequality, due mainly to its relatively large agricultural share in the urban sector. There seems to be a positive relationship between rural inequality and rural mean per capita income across administrative divisions: larger rural mean per capita income tends to be associated with higher rural inequality.

Gender and age are not key determinants of rural and urban inequalities. Households represented by an active working member engaged in non-agricultural activities have a larger mean per capita income than those in agriculture in both rural and urban sectors; but, the disparity is not large. Interestingly, in the rural sector, households in the agriculture group have a higher within-group inequality than those in non-agriculture. Education appears to have played an important role in income inequality, especially in the urban sector, where households represented by an active working member with secondary and higher education have 2.3 times as large mean per capita income as those represented by an active working member without any education. No-education group's inequality accounts for more than half of rural inequality, while the secondary and higher education group has the largest contribution to urban inequality at 37%.

According to the decomposition of inequality by income sources, business income (profits earned in various entrepreneurial activities) serves to have raised rural inequality, while agro income (income from various agricultural activities) and formal income (wages and salaries earned in farm and non-farm activities) serve to have lowered rural inequality. These three income sources, i.e., agro, formal and business incomes, account, respectively, for 29%, 24%, and 21% of rural inequality. Remittance income and rental income are both inequality-increasing sources in the rural sector, while transfer income serves to have lowered rural inequality. Like in the rural sector, business income is an inequality-increasing source in the urban sector, while formal income serves to have lowered urban inequality. Thus, business income accounts for 44% of urban inequality, while the contribution of formal income to urban inequality is 30%. Among the other income sources, agro income and transfer income are inequality-reducing sources, while retirement income and rental income serve to have raised urban inequality. But their contributions to urban inequality are not large.

In the rural sector, 36% of its people are under the poverty line, compared to 22% in the urban sector; thus the rural sector accommodates 72% of the poor in the nation, much larger than its population share of 61%. Rural poverty is also deeper and severer than urban poverty, as indicated by average income shortfall and inequality among the poor, signifying that a large number of very poor people exist in the rural sector. Barishal is the poorest division; 37% of its people are under the poverty line. Rural

Barishal is especially poor; but it accounts for 8% of the poor in the nation, due to its small population share. Rajshahi, Chittagong and Dhaka follow next, where about 30% of their people are under the poverty line. Particularly, rural Dhaka and rural Chittagong have high poverty headcount ratios. Poverty in these two rural areas is also deep and severe. In the urban sector, Rajshahi has the largest headcount ratio, indicating that poverty is not only a rural problem but also an urban problem in Rajshahi. On the other hand, urban Dhaka has a relatively small headcount ratio; but poverty in urban Dhaka is deep and severe, as indicated by a relatively large average income shortfall and inequality among the poor. Due partly to its relatively high mean per capita income, Sylhet has the smallest incidence of poverty in both rural and urban sectors. In the rural sector, Khulna follows next, due to its very small average income shortfall and inequality among the poor.

Education seems to be one of the most important factors of the incidence of poverty. In both rural and urban sectors, the no-education group registers the highest poverty headcount ratio, which is followed by the primary education and secondary and higher education groups. In the rural sector, 43% of those in the no-education group are under the poverty line, while in the urban sector, the proportion is 33%. The no-education group accounts for 64% of the poor in the nation. Household members represented by active working members who are engaged in agriculture also have a very high incidence of poverty; 44% and 41% of those in the rural and urban sectors are under the poverty line, respectively.

Based on these observations, some policy recommendations can be formulated. Since disparity among administrative divisions is small, inequalities within each administrative division need to be reduced. Particularly, urban inequality should be reduced, because it is much larger than rural inequality in all administrative divisions and urbanization proceeds in tandem with globalization and liberalization. Since education appears to have played an important role in income inequality, especially urban inequality, raising general educational level and promoting quality education are essential. Since wages and salaries from farm and non-farm activities serve to have mitigated income inequality, especially in the urban sector, opportunities for formal income should be expanded. Though the effect may be small, transfer programs, such as social safety net programs, should be expanded and strengthened in order to raise

income among the poorest population.

In addition to raising general educational level and promoting quality education, it is necessary to provide at least primary education throughout the country in order to mitigate poverty. At the same time, it is imperative to raise agricultural productivity in both rural and urban sectors, since the incidence of poverty is very high for those who are represented by active working members engaged in agriculture. Furthermore, non-agricultural activities need to be expanded and promoted in accordance with the country's pattern of comparative advantages, since the non-agriculture group has a much lower incidence of poverty. Since the 31-40 and 41-50 year old groups have a very high headcount ratio in the rural sector, another policy option to reduce poverty, in the short run, would be to give effective vocational training programs to these groups.

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Table 1
Geographical Distribution of Households in the 2005 Survey Sample

| | Rural (%) | Urban (%) | Total (%) | Urbanization Rate (%) | Household Size |
|--------------|-------------|-------------|--------------|-----------------------|----------------|
| Barishal | 5.4 | 2.5 | 8.0 | 31.9 | 5.1 |
| Chittagong | 10.0 | 7.4 | 17.5 | 42.5 | 5.5 |
| Dhaka | 16.4 | 12.6 | 29.0 | 43.5 | 4.8 |
| Khulna | 8.6 | 6.3 | 14.9 | 42.3 | 4.7 |
| Rajshahi | 16.5 | 9.4 | 25.9 | 36.3 | 4.6 |
| Sylhet | 3.1 | 1.6 | 4.7 | 33.7 | 5.5 |
| Total | 60.1 | 39.9 | 100.0 | 39.9 | 4.9 |

Table 2
Decomposition of Overall Inequality by Location (Urban vs. Rural Sectors)

| | Theil T | Theil L | Gini | Mean Income | Pop. Share (%) | Income Share (%) |
|----------------|--------------|--------------|--------------|---------------|----------------|------------------|
| Urban | 0.709 | 0.473 | 0.513 | 25,190 | 39.9 | 50.4 |
| (% Contribu.) | 48.1 | 40.2 | | | | |
| Rural | 0.730 | 0.430 | 0.477 | 16,489 | 60.1 | 49.6 |
| (% Contribu.) | 48.9 | 55.1 | | | | |
| Within sector | 0.719 | 0.447 | | | | |
| (% Contribu.) | 97.0 | 95.3 | | | | |
| Between sector | 0.022 | 0.022 | | | | |
| (% Contribu.) | 3.0 | 4.7 | | | | |
| Total | 0.741 | 0.469 | 0.504 | 19,961 | | |

Table 3
Decomposition of Inequality among the Richest 1% Households by Location (Urban vs. Rural Sectors)

| | Theil T | Theil L | Gini | Mean Income | Pop. Share (%) | Income Share (%) |
|----------------|--------------|--------------|--------------|----------------|----------------|------------------|
| Urban | 0.596 | 0.383 | 0.474 | 305,629 | 71.0 | 60.3 |
| (% Contribu.) | 47.1 | 53.8 | | | | |
| Rural | 0.952 | 0.719 | 0.623 | 491,699 | 29.0 | 39.7 |
| (% Contribu.) | 49.5 | 41.3 | | | | |
| Within sector | 0.738 | 0.481 | | | | |
| (% Contribu.) | 96.6 | 95.1 | | | | |
| Between sector | 0.026 | 0.025 | | | | |
| (% Contribu.) | 3.4 | 4.9 | | | | |
| Total | 0.764 | 0.506 | 0.540 | 359,649 | | |

Table 4
Decomposition of Overall Inequality by Location (Urban vs. Rural Sectors)
Excluding Three Very Rich Households

| | Theil T | Theil L | Gini | Mean Income | Pop. Share (%) | Income Share (%) |
|----------------|--------------|--------------|--------------|---------------|----------------|------------------|
| Urban | 0.530 | 0.425 | 0.488 | 23,981 | 39.9 | 51.3 |
| (% Contribu.) | 56.2 | 42.1 | | | | |
| Rural | 0.381 | 0.345 | 0.430 | 15,104 | 60.1 | 48.7 |
| (% Contribu.) | 38.3 | 51.4 | | | | |
| Within sector | 0.458 | 0.377 | | | | |
| (% Contribu.) | 94.5 | 93.5 | | | | |
| Between sector | 0.027 | 0.026 | | | | |
| (% Contribu.) | 5.5 | 6.5 | | | | |
| Total | 0.484 | 0.403 | 0.470 | 18,647 | | |

Table 5
Decomposition of Overall Inequality by Administrative Division (Region)

| | Theil T | Theil L | Gini | Mean | Pop Share (%) | Income Share (%) |
|----------------|--------------|--------------|--------------|---------------|---------------|------------------|
| Barishal | 0.392 | 0.368 | 0.440 | 16,679 | 8.0 | 7.1 |
| (% Contribu.) | 5.8 | 7.3 | | | | |
| Chittagong | 0.617 | 0.448 | 0.490 | 20,351 | 17.5 | 19.1 |
| (% Contribu.) | 24.3 | 19.4 | | | | |
| Dhaka | 0.513 | 0.459 | 0.490 | 20,529 | 29.0 | 32.0 |
| (% Contribu.) | 33.8 | 33.1 | | | | |
| Khulna | 0.449 | 0.349 | 0.455 | 17,884 | 14.9 | 14.3 |
| (% Contribu.) | 13.3 | 12.9 | | | | |
| Rajshahi | 0.350 | 0.320 | 0.425 | 15,711 | 25.9 | 21.8 |
| (% Contribu.) | 15.8 | 20.5 | | | | |
| Sylhet | 0.467 | 0.426 | 0.491 | 22,610 | 4.7 | 5.7 |
| (% Contribu.) | 5.5 | 5.0 | | | | |
| Within region | 0.477 | 0.396 | | | | |
| (% Contribu.) | 98.5 | 98.2 | | | | |
| Between region | 0.007 | 0.007 | | | | |
| (% Contribu.) | 1.5 | 1.8 | | | | |
| Total | 0.484 | 0.403 | 0.470 | 18,647 | | |

Table 6
Decomposition of Inequality by Location (Urban vs. Rural Sectors) for Each
Administrative Division

| | Theil T | % Contribution | Gini | Mean Income | Income Share (%) |
|-------------------|--------------|----------------|--------------|---------------|------------------|
| Barishal | | | | | |
| Urban | 0.452 | 51.4 | 0.459 | 23,310 | 44.6 |
| Rural | 0.281 | 39.7 | 0.401 | 13,572 | 55.4 |
| Within sector | 0.357 | 91.1 | | | |
| Between sector | 0.035 | 8.9 | | | |
| Total | 0.392 | 100.0 | 0.440 | 16,679 | 100.0 |
| Chittagong | | | | | |
| Urban | 0.711 | 63.8 | 0.525 | 26,524 | 55.4 |
| Rural | 0.426 | 30.8 | 0.427 | 15,786 | 44.6 |
| Within sector | 0.584 | 94.6 | | | |
| Between sector | 0.034 | 5.4 | | | |
| Total | 0.617 | 100.0 | 0.490 | 20,351 | 100.0 |
| Dhaka | | | | | |
| Urban | 0.493 | 54.8 | 0.482 | 26,889 | 57.0 |
| Rural | 0.453 | 38.0 | 0.460 | 15,634 | 43.0 |
| Within sector | 0.476 | 92.9 | | | |
| Between sector | 0.037 | 7.1 | | | |
| Total | 0.513 | 100.0 | 0.490 | 20,529 | 100.0 |
| Khulna | | | | | |
| Urban | 0.492 | 55.3 | 0.474 | 21,335 | 50.5 |
| Rural | 0.378 | 41.7 | 0.422 | 15,350 | 49.5 |
| Within sector | 0.436 | 97.0 | | | |
| Between sector | 0.014 | 3.0 | | | |
| Total | 0.449 | 100.0 | 0.455 | 17,884 | 100.0 |
| Rajshahi | | | | | |
| Urban | 0.391 | 46.1 | 0.441 | 17,871 | 41.3 |
| Rural | 0.313 | 52.4 | 0.410 | 14,479 | 58.7 |
| Within sector | 0.345 | 98.5 | | | |
| Between sector | 0.005 | 1.5 | | | |
| Total | 0.350 | 100.0 | 0.425 | 15,711 | 100.0 |
| Sylhet | | | | | |
| Urban | 0.415 | 48.8 | 0.471 | 36,758 | 54.8 |
| Rural | 0.323 | 31.3 | 0.422 | 15,416 | 45.2 |
| Within sector | 0.374 | 80.0 | | | |
| Between sector | 0.093 | 20.0 | | | |
| Total | 0.467 | 100.0 | 0.491 | 22,610 | 100.0 |

Table 7
Distribution of Households by Gender, Age, Household Size, Education and Sector
(in %)

| | Rural | Urban | Total |
|-----------------------|-------|-------|-------|
| Gender | | | |
| Female | 16.7 | 14.4 | 15.7 |
| Male | 83.3 | 85.6 | 84.3 |
| Age | | | |
| 0-20 | 9.4 | 7.9 | 8.8 |
| 21-30 | 19.8 | 20.3 | 20.0 |
| 31-40 | 28.1 | 31.3 | 29.4 |
| 41-50 | 22.8 | 24.4 | 23.5 |
| 51-60 | 12.0 | 11.1 | 11.6 |
| 61+ | 7.9 | 4.9 | 6.7 |
| Household Size | | | |
| 1-3 | 21.6 | 23.2 | 22.2 |
| 4 | 23.0 | 26.5 | 24.4 |
| 5 | 21.1 | 21.5 | 21.3 |
| 6 | 15.5 | 14.0 | 14.9 |
| 7- | 18.8 | 14.8 | 17.2 |
| Education | | | |
| No Education | 56.8 | 42.1 | 50.9 |
| Primary | 30.8 | 32.0 | 31.3 |
| Secondary & Higher | 12.4 | 26.0 | 17.8 |
| Sector | | | |
| Agriculture | 49.6 | 14.1 | 35.4 |
| Non-agriculture | 50.4 | 85.9 | 64.6 |

Table 8
Inequality Decomposition by Gender, Age, Education, and
Agriculture/Non-agriculture Sector in the Rural and Urban Sectors

| | Rural | | | | Urban | | | |
|--------------------|--------------|----------------|--------------|---------------|--------------|----------------|--------------|---------------|
| | Theil T | % Contribution | Gini | Mean | Theil T | % Contribution | Gini | Mean |
| Gender | | | | | | | | |
| Female | 0.326 | 15.8 | 0.406 | 16,706 | 0.502 | 14.7 | 0.497 | 25,846 |
| Male | 0.392 | 83.9 | 0.434 | 14,784 | 0.535 | 85.3 | 0.486 | 23,669 |
| Within-group | 0.380 | 99.7 | | | 0.530 | 99.9 | | |
| Between-group | 0.001 | 0.3 | | | 0.001 | 0.1 | | |
| Age | | | | | | | | |
| 0-20 | 0.367 | 9.5 | 0.414 | 15,777 | 0.434 | 5.6 | 0.417 | 20,888 |
| 21-30 | 0.329 | 18.3 | 0.407 | 16,148 | 0.406 | 14.4 | 0.451 | 22,175 |
| 31-40 | 0.397 | 27.5 | 0.437 | 14,212 | 0.652 | 39.0 | 0.523 | 24,244 |
| 41-50 | 0.330 | 18.3 | 0.421 | 13,976 | 0.574 | 28.7 | 0.504 | 26,079 |
| 51-60 | 0.509 | 18.4 | 0.459 | 17,353 | 0.373 | 8.5 | 0.455 | 26,086 |
| 61+ | 0.358 | 7.2 | 0.432 | 14,707 | 0.413 | 3.1 | 0.454 | 19,558 |
| Within-group | 0.378 | 99.2 | | | 0.527 | 99.3 | | |
| Between-group | 0.003 | 0.8 | | | 0.004 | 0.7 | | |
| Education | | | | | | | | |
| No Education | 0.386 | 50.7 | 0.417 | 13,281 | 0.409 | 22.2 | 0.433 | 16,446 |
| Primary | 0.345 | 28.5 | 0.411 | 15,425 | 0.511 | 29.5 | 0.467 | 22,951 |
| Secondary & Higher | 0.331 | 16.2 | 0.427 | 22,660 | 0.487 | 37.2 | 0.471 | 37,463 |
| Within-group | 0.363 | 95.3 | | | 0.472 | 88.9 | | |
| Between-group | 0.018 | 4.7 | | | 0.059 | 11.1 | | |
| Sector | | | | | | | | |
| Agriculture | 0.447 | 52.1 | 0.450 | 13,515 | 0.520 | 8.9 | 0.459 | 15,425 |
| Non-agriculture | 0.318 | 46.5 | 0.403 | 16,670 | 0.518 | 88.9 | 0.485 | 25,384 |
| Within-group | 0.375 | 98.6 | | | 0.519 | 97.8 | | |
| Between-group | 0.005 | 1.4 | | | 0.012 | 2.2 | | |
| Total | 0.381 | 100.0 | 0.430 | 15,104 | 0.530 | 100.0 | 0.488 | 23,981 |

Table 9
Inequality Decomposition by Income Sources in the Rural and Urban Sectors

| | Income Share (%) | Concentration Ratio | Gini Coefficient | Relative Concentration Ratio | % Contribution |
|---------------------|---------------------|------------------------|---------------------|------------------------------------|-------------------|
| | wk | Ck | Gk | gk | wk*gk |
| Rural Sector | | | | | |
| Agriculture | 35.7 | 0.346 | 0.660 | 0.805 | 28.7 |
| Formal | 25.6 | 0.394 | 0.754 | 0.917 | 23.5 |
| Business | 16.5 | 0.546 | 0.883 | 1.270 | 21.0 |
| Retirement | 0.8 | 0.817 | 0.989 | 1.901 | 1.5 |
| Remittance | 7.7 | 0.632 | 0.924 | 1.471 | 11.3 |
| Rental | 3.6 | 0.565 | 0.913 | 1.316 | 4.7 |
| Transfer | 1.8 | 0.163 | 0.843 | 0.379 | 0.7 |
| Miscellaneous | 8.4 | 0.448 | 0.831 | 1.044 | 8.7 |
| Total | 100.0 | 0.430 | 0.430 | | 100.0 |
| Urban Sector | | | | | |
| Agriculture | 8.5 | 0.276 | 0.886 | 0.565 | 4.8 |
| Formal | 39.1 | 0.374 | 0.649 | 0.765 | 29.9 |
| Business | 33.1 | 0.644 | 0.859 | 1.319 | 43.7 |
| Retirement | 1.1 | 0.745 | 0.989 | 1.525 | 1.7 |
| Remittance | 4.2 | 0.537 | 0.932 | 1.100 | 4.6 |
| Rental | 4.9 | 0.637 | 0.910 | 1.305 | 6.4 |
| Transfer | 1.0 | 0.169 | 0.901 | 0.347 | 0.4 |
| Miscellaneous | 8.0 | 0.520 | 0.869 | 1.065 | 8.5 |
| Total | 100.0 | 0.488 | 0.488 | | 100.0 |

Table 10
Poverty by Location (Urban vs. Rural Sectors)

| | P0 | P1 | P2 | Income Shortfall (<i>I</i>) | Inequality among Poor (<i>C</i> ²) | Population Share (%) |
|---------------|--------------|--------------|--------------|----------------------------------|--|-------------------------|
| Urban | 0.224 | 0.070 | 0.034 | 0.315 | 0.111 | 38.8 |
| (% Contribu.) | 28.5 | 26.2 | 24.7 | | | |
| Rural | 0.355 | 0.126 | 0.065 | 0.355 | 0.139 | 61.2 |
| (% Contribu.) | 71.5 | 73.8 | 75.3 | | | |
| Total | 0.304 | 0.105 | 0.053 | 0.344 | 0.131 | 100.0 |

Table 11
Poverty by Region

| | P0 | P1 | P2 | Income Shortfall (<i>I</i>) | Inequality among Poor (<i>C</i> ²) | Population Share (%) |
|---------------|--------------|--------------|--------------|-------------------------------|---|----------------------|
| Barishal | 0.374 | 0.139 | 0.073 | 0.371 | 0.146 | 8.2 |
| (% Contribu.) | 10.1 | 10.9 | 11.3 | | | |
| Chittagong | 0.308 | 0.109 | 0.057 | 0.355 | 0.145 | 20.1 |
| (% Contribu.) | 20.3 | 21.0 | 21.7 | | | |
| Dhaka | 0.302 | 0.113 | 0.062 | 0.374 | 0.167 | 28.6 |
| (% Contribu.) | 28.4 | 31.0 | 33.4 | | | |
| Khulna | 0.282 | 0.077 | 0.032 | 0.275 | 0.070 | 14.0 |
| (% Contribu.) | 13.0 | 10.4 | 8.4 | | | |
| Rajshahi | 0.309 | 0.099 | 0.047 | 0.322 | 0.107 | 23.6 |
| (% Contribu.) | 23.9 | 22.4 | 20.9 | | | |
| Sylhet | 0.236 | 0.082 | 0.042 | 0.350 | 0.128 | 5.4 |
| (% Contribu.) | 4.2 | 4.3 | 4.3 | | | |
| Total | 0.304 | 0.105 | 0.053 | 0.344 | 0.131 | 100.0 |

Table 12
Poverty by Administrative Division (Region) in the Rural and Urban Sectors

| | Rural | | | | Urban | | | |
|--------------|--------------|-------------|-------------------------------|---|--------------|-------------|-------------------------------|---|
| | P0 | % Contribu. | Income Shortfall (<i>I</i>) | Inequality among Poor (<i>C</i> ²) | P0 | % Contribu. | Income Shortfall (<i>I</i>) | Inequality among Poor (<i>C</i> ²) |
| Barishal | 0.433 | 7.9 | 0.388 | 0.161 | 0.252 | 2.2 | 0.310 | 0.093 |
| Chittagong | 0.360 | 14.3 | 0.371 | 0.155 | 0.229 | 6.0 | 0.316 | 0.118 |
| Dhaka | 0.391 | 21.3 | 0.386 | 0.166 | 0.180 | 7.1 | 0.341 | 0.164 |
| Khulna | 0.312 | 8.5 | 0.267 | 0.068 | 0.238 | 4.5 | 0.289 | 0.075 |
| Rajshahi | 0.322 | 15.9 | 0.327 | 0.115 | 0.284 | 8.1 | 0.312 | 0.091 |
| Sylhet | 0.296 | 3.6 | 0.367 | 0.143 | 0.103 | 0.6 | 0.240 | 0.036 |
| Total | 0.355 | 71.5 | 0.355 | 0.139 | 0.224 | 28.5 | 0.315 | 0.111 |

Table 13
Poverty by Gender, Age, Education, and Agriculture/Non-agriculture Sector in the Rural and Urban Sectors

| | Rural | | | | Urban | | | |
|------------------|-------|----------------|----------------------------|---|-------|----------------|----------------------------|---|
| | P0 | % Contribu. | Income Shortfall (I) | Inequality among Poor (C ²) | P0 | % Contribu. | Income Shortfall (I) | Inequality among Poor (C ²) |
| Gender | | | | | | | | |
| Female | 0.258 | 7.3% | 0.305 | 0.103 | 0.204 | 3.3% | 0.316 | 0.103 |
| Male | 0.379 | 64.2% | 0.360 | 0.143 | 0.229 | 25.2% | 0.309 | 0.106 |
| Age | | | | | | | | |
| 0-20 | 0.318 | 6.4% | 0.329 | 0.114 | 0.188 | 2.1% | 0.224 | 0.048 |
| 21-30 | 0.277 | 10.7% | 0.318 | 0.119 | 0.230 | 5.6% | 0.263 | 0.073 |
| 31-40 | 0.418 | 22.8% | 0.346 | 0.117 | 0.250 | 9.8% | 0.325 | 0.107 |
| 41-50 | 0.412 | 19.3% | 0.380 | 0.171 | 0.227 | 7.1% | 0.326 | 0.122 |
| 51-60 | 0.326 | 7.6% | 0.365 | 0.165 | 0.178 | 2.6% | 0.341 | 0.128 |
| 61+ | 0.327 | 4.7% | 0.387 | 0.161 | 0.224 | 1.3% | 0.390 | 0.206 |
| Education | | | | | | | | |
| No Education | 0.425 | 46.3% | 0.356 | 0.142 | 0.334 | 17.4% | 0.319 | 0.108 |
| Primary | 0.320 | 20.2% | 0.347 | 0.123 | 0.211 | 8.7% | 0.295 | 0.100 |
| Second/Higher | 0.196 | 5.0% | 0.366 | 0.181 | 0.071 | 2.3% | 0.293 | 0.114 |
| Sector | | | | | | | | |
| Agriculture | 0.441 | 42.7% | 0.394 | 0.170 | 0.411 | 7.3% | 0.381 | 0.165 |
| Non-agriculture | 0.286 | 28.9% | 0.295 | 0.093 | 0.195 | 21.2% | 0.285 | 0.086 |

Figure 1
Lorenz Curves for Urban and Rural Sectors

