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**POVERTY TRENDS
AND
AGRICULTURAL GROWTH
LINKAGES**

MUSTAFA K. MUJERI

DECEMBER 2000

FMRSP Working Paper No. 26

FMRSP Bangladesh

Food Management & Research Support Project
Ministry of Food, Government of the People's Republic of Bangladesh

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EXECUTIVE SUMMARY

The paper reviews recent trends in poverty and explores the channels through which agricultural growth benefits reach the poor. The objective is to identify emerging challenges and suggest future directions of agricultural growth for promoting an enabling environment for poverty alleviating growth in the country.

Despite data limitations and absence of adequate information to discern long term trends, assessment of the poverty situation since the 1980s highlights several features: (i) the overall poverty incidence in the country has been declining at a slow rate of less than 2 percent a year; (ii) a faster decline of rural poverty is noticed in the late 1990s; and (iii) the absolute number of the poor has started to decline since the mid-1990s. The rural-urban decomposition of past poverty changes indicates that reduction of rural poverty is critical for Bangladesh. The incidence of poverty also reveals wide variation across different regions. The results indicate that there are seven regions (old districts) where the levels of incidence of both rural and urban poverty exceed their national averages. These are: Barisal, Bogra, Faridpur, Jamalpur, Mymensingh, Pabna and Rangpur. The poverty characteristics indicate significant differences in both income and non-income dimensions including physical and human resource endowments, demographic features and occupational groups.

With a low level of per capita income and slow growth in key social indicators, Bangladesh needs to adopt a multi-strategy solution for poverty reduction. Within the strategy, economic growth matters for reducing both income and non-income poverty. In particular, a 'pro-poor' or 'broad-based' growth is necessary so that increasing benefits for the poor are generated. Over the 1984-1999 period, per capita GDP increased at a rate of 2.5 percent per year while per capita agricultural GDP increased at only 0.8 percent. A comparison of the growth rates over different sub-periods with corresponding changes in incidence of poverty reveals some links between growth and poverty. The evidence

suggests that declining poverty, in general, is associated with relatively high GDP growth originating in agriculture. In terms of structure and sectoral composition of economic growth, the poverty-reducing role of agriculture seems to be important. The poor mostly live in rural areas and depend on agricultural activities for their livelihood. A rural resident is also more likely to be poor. The growth of agriculture has several advantages in accelerating overall growth and creating a growth structure that contributes to raising the poor's income. The impact of agricultural growth on rural wages is an important element in the process since, for the poor households, a major share of income originates from wage labor in agricultural and non-agricultural activities. A high agricultural growth also creates synergies for diversification of the rural economy and development of the rural non-farm sector with greater poverty reduction impact. It is, therefore, important for Bangladesh to accelerate growth of agriculture and non-farm sector, improve coverage and quality of social services, ensure well-functioning rural institutions, and expand rural infrastructure.

Past Patterns of Agricultural Growth

Since the 1970s, Bangladesh agriculture experienced a modest growth and a slow transition: with wide fluctuations, agricultural growth averaged around 2.5 percent per

Table E.1 — Annual Growth in Agriculture

	Percent at constant 1995/96 prices	
	1991-1996	1997-2000
Agriculture	1.8	5.1
of which:		
Crops & horticulture	-0.1	4.2
Animal farming	2.4	2.7
Forest & related activities	2.9	4.7
Fishing	7.8	9.0
GDP	4.4	5.3

Source: BBS.

year and growth of output barely kept pace with population growth. A significant acceleration of agricultural growth has, however, taken place during the second-half of the 1990s: annual growth exceeded 5 percent during 1997-2000 compared to 2 percent during 1991-1996 (Table E.1).

In particular, significant increase in rice and wheat production has been achieved since the 1970s. The production more than doubled since 1971: foodgrain (rice and wheat) production increased from around 10 million tons in early 1970s to exceed 24 million tons by late 1990s.

FOOD CONSUMPTION PATTERN AND FOOD PRICES

Despite low agricultural growth in the past, regions with relatively high level of per capita agricultural and total income and regions that experienced more rapid growth have performed better in reducing poverty. Over the last two decades, reforms in the agricultural sector and dismantling of state interventions have played a crucial role in increasing agricultural production. The post-reform period also witnessed decline in real agricultural prices and rise in agricultural productivity. As a result, relative food price declined in rural areas, which benefited the majority of the households, particularly the poor, who are net purchasers of food.

Since the 1980s, two major changes in consumption pattern in rural and urban areas have taken place: shift in consumption from cereals to non-cereals within food and from food to nonfood in overall consumption (Table E.2). The trends are stronger in urban areas. In case of quantity of consumption of cereals, per capita intake increased in both rural and urban areas over the period. Large differences, however, exist in food intake between the poor and the non-poor in both rural and urban areas. Two contrasting trends in rice consumption in rural and urban areas are present. First, per capita rice consumption is higher for the non-poor in rural areas compared to the poor. Hence, rice consumption will increase as people move out of poverty in rural areas – the average rice consumption of the non-poor is nearly 20 percent higher than the poor. Second, food

Table E.2 — Distribution of Monthly Per Capita Consumption Expenditure

	(Percent)					
	Rural			Urban		
	1983/84	1991/92	1995/96	1983/84	1991/92	1995/96
Food	66.7	69.2	62.4	56.7	56.1	46.3
of which:						
Cereals	38.0	35.9	29.8	25.6	21.7	14.4
Non-cereals	28.7	33.3	32.6	31.1	34.4	31.9
Nonfood	33.3	30.8	37.6	43.3	43.9	53.7
Total	100	100	100	100	100	100

Source: BBS, *Household Expenditure Survey*, various years.

consumption pattern is less rice intensive in urban areas for both the poor and the non-poor compared to that in rural areas. The trend of accelerated pace of urbanization in future will thus have a moderating impact on total rice consumption.

IMPLICATIONS ON FUTURE AGRICULTURAL GROWTH

Two dominant factors are likely to shape future structural changes and growth pattern of Bangladesh agriculture: declining rate of population growth and higher growth in per capita income. The annual growth rate of population has declined from around 2.5 percent in the 1980s to 1.6 percent in the late 1990s and the target is to achieve $NRR = 1$ by the year 2005. The growth rate of per capita GDP has also increased: from less than 2 percent per year in the 1980s to around 4 percent in late 1990s. The past demand for agricultural output was determined by high population growth and slow growth in per capita income so that the consumption pattern did not reflect much the differential growth in demand for agricultural products. In contrast, income – induced pattern of demand for agricultural output is likely to emerge as the major determinant of future food consumption. This would imply a lower growth in demand for cereals and a strong market demand for non-cereal crops and non-crop agriculture. The likely changes in demand for agricultural products imply that significant adjustments and resource re-allocations will be needed to ensure required growth and structural changes in Bangladesh

agriculture. A faster expansion of non-cereals and non-crop agriculture will be necessary to maintain stable prices, generate higher farm incomes and achieve food security.

In order to maximize the poverty reducing impact of agricultural growth, emphasis is needed on several dimensions of agriculture: in addition to growth of the rural economy, productivity gains and falling real agricultural prices that accompany agricultural growth would allow the supply of low cost food to the people, improve their nutritional status, and enhance food security. At the present stage of development of Bangladesh agriculture and, with the resource constraints, the priority is to ensure yield growth of the staple food (rice), which is a key factor for poverty reduction and food security. This is also necessary to release resources for accelerated growth of non-cereal crops and non-crop agriculture. In designing policies for increasing agriculture's ability to reduce poverty, it needs to be recognized that household income of the poor farmers will not increase much through improvements in agricultural technology due to small size of their holdings and unfavorable terms of trade of the major crop (rice). Improvements in crop productivity will contribute more in terms of increasing supplies and reducing unit cost of production. This will enable access to food by the poor at affordable prices. For increasing household income, expansion of non-crop agriculture and non-farm activities needs to be targeted.

To meet the above challenges, the agricultural policy framework needs to emphasize two key elements: exploitation of economies of scale along lines of comparative advantage and acceleration of agricultural investment embodying technological innovations. For the purpose, actions are necessary in three broad areas: intensification of production of existing crops (e.g. rice), diversification to high return crops having comparative advantage, and improvements in non-crop agriculture. In order to better manage the resource base and ensure sustainable exploitation of agronomic potentials, the strategy needs to increase agriculture's competitive edge by combining coherent policies, incentives and programs to pursue efficient production practices, remove supply side constraints, and provide a supportive macro and trade environment.

Increasing the rate of investment in agriculture requires action on two fronts: creating an institutional and policy environment that provides incentives for accelerated private investment; and enhanced public investment in key areas to ensure adequate availability of public goods in agriculture. Public investment in priority areas e.g. applied agricultural research and extension, rural infrastructure, and basic education is vital to agricultural development in Bangladesh. Public investment in agricultural research and development is needed to build capacity to accelerate technological progress. The emphasis needs to be placed on site and season-specific technologies and extension messages in combination with credit and marketing services. Efficient marketing requires public investments in rural infrastructure, electrification, developing regulatory frameworks, and availability of market support services e.g. quality control, grades and standards, and market information. Without investments in these public goods, institutional reforms alone are not likely to produce sustained agricultural growth in Bangladesh.

1. INTRODUCTION

With a low level of per capita income, nearly one of every two persons in Bangladesh is poor, and one of three lives below the income poverty line of \$ 1 a day.¹ If those who are deprived of adequate clothing or shelter or other basic needs are counted, the number will be considerably higher. Similarly, if the people who live “above” the poverty line, but are vulnerable to risks, crisis and socioeconomic shocks and are in constant danger of income erosion below the poverty threshold, are considered, the number will be still larger. The poor in Bangladesh differ in economic, social, physical and other characteristics that reflect various deprivations. Such multidimensionality of the poor's interlocking deprivations highlights that a strategy of increasing income alone may not be adequate for reducing poverty.² With multi-dimensional characteristics, poverty requires a multi-strategy solution in Bangladesh.

The implications of attacking poverty within a broad framework, as emphasized above, bring into forefront the interactions that exist between income and non-income deprivations. An important policy issue of such interactions inevitably poses the question: Do the policies that reduce income-poverty lead to a reduction of non-income poverty as well? It is conceivable that a reduction in income-poverty helps in alleviating non-income poverty through an enhanced capacity of the poor to gain access to basic needs. Such a relationship, moreover, is likely to be stronger at low levels of income (as

¹ According to the 1999 Poverty Monitoring Survey, 44.7 percent of the population are poor on the basis of the poverty line defined in terms of minimum calorie intake. The \$ 1 a day in 1985 PPP \$ takes care of real purchasing power of Taka as against the nominal exchange rate. With this internationally comparable poverty line, 29.1 percent of the population in Bangladesh are poor. See BBS 2000, UNDP 2000. If one uses a nominal exchange rate of Tk. 50 to one US dollar, then the non-PPP adjusted per capita income comes to less than a dollar a day (83 cents in 1999/00).

² This brings out the importance of conceiving poverty within a broader framework entailing, in addition to purchasing power, other forms of deprivation e.g. capability and entitlement, participation, empowerment, vulnerability and crisis coping capacity, networking capacity, intra-household and gender disparities, access to credit and resources, and other social concerns.

in the case of Bangladesh) where the promotion of efficient and pro-poor growth policies would bring substantial social gains.³ Economic growth thus matters for reducing non-income poverty since income-poverty acts as a significant barrier to accessing basic services.⁴ Such an interface is relatively strong in Bangladesh as high economic growth widens opportunities, provides resources for human and non-human investments and increases returns from such investments.⁵ In the present paper, our focus is on agricultural growth and the channels through which growth benefits reach the poor. With economic reforms, the composition of output and relative prices has significantly changed in Bangladesh. Structural changes, particularly in agriculture and the rural economy, have opened up opportunities through the adoption of new crop production technologies, the expansion of non-crop agriculture and the exploitation of growth potential in the non-farm sector. It is necessary, therefore, to review past changes and identify the emerging challenges and opportunities to promote an enabling environment for poverty alleviating growth in the country. The analysis in the paper is mainly expository and is intended to raise several issues and assess recent performance.

³ It may, however, be pointed out that the concept of income inadequacy, which involves the conversion of income into capability, goes well beyond the existence of low income. As a result, the ordering of poverty and identification of the poor based on size of income could be different if the focus is on capability failure. See Sen 1981.

⁴ In the case of primary education, empirical evidence shows that both non-enrollment and drop-out rates vary significantly with the level of income poverty. Income poverty thus emerges as a critical barrier in achieving universal enrollment and completion rates in primary education in Bangladesh. See Mahmud and Sen 1998.

⁵ Economic growth, it is argued, contributes to human development at least in terms of reduced income poverty and increased availability of public resources for investment. See Anand and Ravallion 1993.

2. RECENT POVERTY ESTIMATES AND TRENDS

In Bangladesh, there has now been a long tradition of data collection at the household level for poverty measurement and analysis.⁶ The inter-temporal estimates of poverty reveal substantial variations due to differences in underlying assumptions and methodologies.⁷ Some trends can, however, be discerned with available data (Table 2.1). It shows that the incidence of poverty, as measured by head count index, declined from 59 percent in 1983/84 to 45 percent in 1999. Both urban and rural poverty declined although the incidence of rural poverty remained higher than urban poverty. Two contrasting trends may, however, be noted. Between 1983/84 and 1995/96, urban poverty declined at a faster rate than rural poverty. The incidence of urban poverty was 35 percent in 1995/96 compared to 50 percent in 1983/84.⁸ During the period, rural poverty declined from 60 percent in 1983/84 to 57 percent in 1995/96. On the other hand, the 1997-1999 period witnessed a decline in rural poverty from 47 percent in 1997 to 45 percent in 1999 while urban poverty remained stagnant at around 43 percent in both years. The differential progress in rural and urban poverty reduction, however, conceals

⁶ The typical household surveys, which are nationally representative, refer to the Household Expenditure Survey (HES) and the recently available Poverty Monitoring Survey (PMS) of the Bangladesh Bureau of Statistics (BBS).

⁷ For an analysis of the implications of different methodologies on poverty estimates, see Ravallion 1990, Ravallion and Sen 1996. The alternative poverty estimates highlight important issues of measurement of poverty, aggregation of numbers, choice of calorie norm and other dimensions. For a review of the available estimates, see Rahman and Haque 1988, Hossain and Sen 1992, Mujeri 1999.

⁸ The direct comparison of poverty trends since the 1970s has been avoided due to several methodological problems. A notable problem, for instance, is the change in data collection method in the HES involving a shift from "memory recall" prior to 1983/84 to "diary keeping" afterwards. The 1985/86 HES results have also been excluded from the analysis due to controversy regarding the quality of data. For evidence on declining trends in poverty between the mid-1970s and mid-1980s, see Rahman and Hoque 1988, Mujeri et. al. 1993. On the quality of 1985/86 HES data, see Khan 1990, Ravallion 1990, World Bank 1998. The latest year for which HES data are available is 1995/96. The information for later years is based on the PMS of BBS. It should, however, be noted that the results of the two surveys are not strictly comparable due to differences in survey techniques and poverty estimates.

Table 2.1 — Incidence of Poverty in Bangladesh

Year	Head count ratio (percent)			No. of poor (million)		
	Rural	Urban	Total	Rural	Urban	Total
1983/84	59.6	50.2	58.5	50.3	5.6	55.9
1988/89	59.2	43.9	57.1	54.1	6.2	60.3
1991/92	61.2	44.9	58.8	58.4	7.2	65.6
1995/96	56.7	35.0	53.1	57.8	7.1	64.9
1997	46.8	43.4	46.0	45.3	12.9	58.2
1999	44.9	43.3	44.7	42.4	15.4	57.8

Notes: The figures for 1983/84 to 1995/96 are based on HES while those for 1997 and 1999 are taken from PMS of BBS. The poor in the HES are estimated using the cost of basic needs (CBN) method and are taken as those living below the poverty line which corresponds to an intake of 2122 kcal/person/day and a nonfood allowance which corresponds to nonfood expenditure among households whose food expenditure equals the food poverty line. The poverty lines in the PMS use the food energy intake (FEI) method and refer to calorie intake of 2122 Kcal/person/day in rural areas and 2112 Kcal/person/day in urban areas. The number of the poor has been derived using estimated population and its rural-urban distribution implicit in respective surveys.

Source: World Bank 1998, BBS 1998, 2000.

important dimensions of spatial movements of the poor. Over the 1984-1999 period, the absolute number of poor in the country increased to 58 million from 56 million -- an increase of 2 million over 15 years when total population increased by about 34 million. During the period, the number of rural poor declined from 50 million to 42 million while the number of urban poor recorded an increase -- from 6 million to 15 million.⁹

The period under review also witnessed substantial variations in the rate of poverty reduction across different sub-periods (Table 2.2). Over the 1984-1999 period,

⁹ The increase in the number of the urban poor vis-a-vis the declining number of the rural poor does not necessarily indicate migration of the poor from rural to urban areas. While rural-urban migration of the poor is a reality, the change in the definition of urban areas between the HES and the PMS appears to be a major contributory factor in the increase in the number of the urban poor in the PMS. This is revealed in the share of urban population in total population implicit in the two surveys. For instance, the share of urban population in 1995/96 HES is 16.5 percent while the corresponding shares in 1997 PMS and 1999 PMS are 23.5 percent and 27.3 percent respectively.

Table 2.2 — Annual Changes in the Incidence of Poverty

Head count ratio	(Percent)			
	1984-1999	1984-1992	1992-1996	1997-1999
Rural	-1.87	0.33	-1.91	-2.05
Urban	-0.97	-1.38	-6.01	-0.12
Total	-1.81	0.07	-2.54	-1.42

Source: World Bank 1998, BBS 1998, 2000.

poverty incidence declined at a rate of 1.8 percent per year -- 1.9 percent in rural areas and around 1 percent in urban areas. Within the period, three sub-periods may be identified. During 1984-1992, the incidence of poverty increased marginally due to increasing rural poverty although urban poverty declined at a rate of 1.4 percent per year. In contrast, the 1992-1996 period witnessed a rapid decline in poverty incidence at an annual rate of 2.5 percent -- 1.9 percent in rural areas and 6 percent in urban areas. The 1997-1999 period, on the other hand, recorded a higher rate of poverty reduction in rural areas -- at a rate of more than 2 percent per year -- compared to only 0.12 percent in urban areas. The overall decline in poverty incidence was 1.4 percent per year.

Some trends that emerge from the assessment of the poverty situation highlight the following:

- The overall incidence of poverty in the country has been declining although the rate of decline is slow at less than 2 percent per year;
- Although rural poverty experienced some increase in the late 1980s, a faster decline of rural poverty in the 1990s has taken place;
- Urban poverty has been declining consistently since the 1980s. The rate of decline, however, slowed down in the late-1990s;
- The absolute number of the poor started to decline since the mid-1990s.

Table 2.3 — Trends in Depth and Severity of Poverty

Year	(Percent)					
	Poverty gap			Squared poverty gap		
	Rural	Urban	Total	Rural	Urban	Total
1983/84	16.8	14.3	16.5	6.7	5.8	6.6
1988/89	16.0	11.1	15.4	6.1	3.8	5.8
1991/92	18.1	12.0	17.2	7.2	4.4	6.8
1995/96	15.4	9.2	14.4	5.7	3.4	5.4
1997	11.2	13.5	11.7	3.9	5.8	4.4
1999	11.1	11.2	11.1	4.0	4.2	4.1

Source: World Bank 1998 and BBS 2000

Thus the overall impact of economic growth and associated policies on the poor has been positive leading to a reduction in the incidence of poverty in the country, albeit at a slow rate.

Along with incidence, it is important to analyze changes in other dimensions of poverty e.g. the depth and severity of poverty.¹⁰ The trends in depth and severity are somewhat similar to the incidence of poverty revealing generally higher depth and severity of poverty in rural areas till the mid-1990s (Table 2.3). The depth and severity of urban poverty, however, seem to have worsened afterwards. A contrasting recent trend may also be noticed: while the depth and severity of urban poverty have been declining, recent developments have largely bypassed these poverty dimensions in rural areas.

RURAL-URBAN DECOMPOSITION OF POVERTY CHANGES

The observed changes in poverty at the national level over two periods can be decomposed using an additive framework to assess the contributions of rural and urban

¹⁰ According to the Foster-Greer-Thorbecke (FGT) class of poverty measures, the depth and severity of poverty are given by poverty gap and squared poverty gap respectively. The poverty gap estimates how far below the poverty line the poor are on the average as a proportion of the poverty line, which is a measure of depth of poverty. The squared poverty gap measures the severity of poverty and considers the distance separating the poor from the poverty line and the inequality that exists among the poor. See Foster et. al. 1984.

poverty to the overall change.¹¹ Denoting national poverty by P and poverty measures and population shares of rural and urban areas by P_j and W_j respectively where j stands for rural (r) and urban (u) areas, national poverty (P) of two periods can be decomposed as:

$$P' - P^o = W_r^o(P_r' - P_r^o) + W_u^o(P_u' - P_u^o) + \sum_j (W_j' - W_j^o) P_j^o + \sum_j (W_j' - W_j^o)(P_j' - P_j^o)$$

The first two terms provide the impact of intra-locational changes in poverty while the third term captures the effect of population shifts between rural and urban areas. The last term is a covariance measure of interactions.

The results of rural-urban decomposition over two periods -- 1983/84 to 1995/96 and 1997 to 1999 -- are provided in Table 2.4. During the first period, national poverty as well as rural and urban poverty, declined in terms of all three FGT measures, e.g. head

Table 2.4 — Rural-Urban Decomposition of National Poverty Changes

	(Percent)					
	1983/84 - 1995/96			1997 - 1999		
	Head count ratio	Poverty gap	Squared poverty gap	Head count ratio	Poverty gap	Squared poverty gap
Intra-locational change						
Rural areas	48.2	58.7	69.2	94.4	13.3	-23.5
Urban areas	32.6	27.5	21.9	1.6	90.0	125.3
Population shifts	8.4	5.7	3.7	8.4	-15.0	-23.3
Interactions	10.8	8.1	5.2	-4.4	11.7	21.5
Total	100	100	100	100	100	100

Source: Author's calculations.

¹¹ The methodology is based on the additive property of the FGT class of poverty measures. The property ensures that any FGT measure for a group is equal to the sum of its sub-group poverty measures weighted by respective population shares. For details on the methodology see Ravallion and Huppi 1991.

count ratio, poverty gap and squared poverty gap. The results suggest that each of the elements of change contributed to the decline in poverty. For head count ratio, the contribution of rural areas to the overall decline in national incidence was 48 percent compared to 33 percent of urban areas. Given the relatively small share of the urban population, the contribution of reduction in urban poverty was significant due to a large decline in the incidence of urban poverty during the period.¹²

In the decline of poverty gap and squared poverty gap measures, the dominance of rural areas is also evident. The population shift component contributed to poverty reduction as migration from rural to urban areas where poverty was lower tended to reduce overall poverty. The changes in the second period provide some contrasts with the above results. During 1997-1999, intra-locational changes in head count ratio were overwhelmingly dominated by rural areas with 94 percent of the national decline contributed by rural poverty reduction. The urban contribution is less than 2 percent. In reducing the depth and severity of poverty, the contribution of urban areas was, however, dominant. In fact, intra-sectoral changes in rural areas tended to increase the severity of poverty as reflected in the increased value of squared poverty gap measure during the period. The process of rural-urban migration contributed positively to reducing the incidence of poverty but increased the depth and severity of poverty since these measures revealed the existence of higher disparity in urban areas during the period. The results, nevertheless, point to one important aspect of poverty reduction interventions in Bangladesh: reduction of rural poverty is critical for Bangladesh since poverty in the country exists predominantly in rural areas where nearly three-quarters of all poor people reside.

¹² The share of urban population, implicit in 1983/84 HES, was 11.7 percent, which increased to 16.5 percent in 1995/96.

REGIONAL VARIATIONS IN POVERTY INCIDENCE

The incidence of poverty in the country reveals wide variation across different regions (Table 2.5).¹³ The results highlight several aspects of regional differences in poverty. The estimates of monthly per capita poverty line reveal large differences across regions.¹⁴ For rural areas, the highest poverty line is estimated for Noakhali at Tk. 734 which is 54 percent higher than Tk. 477 for Rangpur. On the other hand, the urban poverty line in Comilla is the highest at Tk. 1045 and lowest for Dinajpur at Tk. 609 -- a difference of 72 percent. The difference between rural and urban areas in the same region also reveals substantial variations -- 95 percent in Kushtia and 14 percent in Noakhali. Such large differences in estimated poverty lines across regions and between rural and urban areas suggest the importance of spatial dimensions of price variations and food consumption patterns affecting the poverty status of the individuals. Likewise, the incidence of rural poverty varies from 39 percent in Khulna and Kishoreganj to 56 percent in Mymensingh. Similarly, urban poverty ranges from 30 percent in Comilla to 58 percent in Tangail. The depth and severity of poverty indicate a somewhat different regional pattern. The depth of rural poverty is highest in Faridpur and lowest in Kushtia while severity is worst in Noakhali and least in Patuakhali and Rajshahi. In case of urban areas, the worst depth of poverty is observed in Faridpur and it is least in Sylhet. The severity of urban poverty manifests its highest incidence in Mymensingh and lowest in Sylhet.

¹³ The regional estimates of poverty based on statistically representative data are not readily available. The 1999 PMS used a large sample consisting of 10,000 rural households and 6,000 urban households to generate poverty measures separately for rural and urban areas at the level of 21 regions (old districts) of the country. See BBS 2000. In the absence of comparable data, analysis of changes in poverty at the regional level is not undertaken.

¹⁴ The poverty line is estimated by adopting the food energy intake (FEI) method which uses an equation of the form $\ln y = a + bx + u$ where y is monthly per capita total (food and nonfood) expenditure, x is daily per capita calorie intake and u is the disturbance term. Separate urban and rural poverty lines have been estimated for each region. The threshold per capita per day calorie intake for the poverty line is taken as 2122 Kcal for rural areas and 2112 kcal for urban areas. For details see BBS 2000.

Table 2.5 — Urban and Rural Poverty at the Regional Level, 1999

	Monthly per capita poverty line (Tk.)		Head count index (percent)			Poverty gap (percent)		Squared poverty gap (percent)	
	Rural	Urban	Rural	Urban	Total	Rural	Urban	Rural	Urban
Barisal	597	832	51.0	44.5	50.6	13.1	12.5	5.0	5.0
Patuakhali	579	783	39.5	52.2	39.7	10.0	11.0	2.7	3.0
Chittagong	624	879	43.4	39.7	42.2	9.7	9.9	3.1	3.7
Chittagong H.T.	585	759	41.5	48.4	42.2	9.9	7.5	3.6	2.5
Comilla	616	1045	44.9	30.1	44.2	10.9	8.3	3.9	3.0
Noakhali	734	834	47.5	36.1	46.9	14.2	13.6	5.8	6.2
Dhaka	704	957	43.4	43.3	43.4	10.7	10.9	3.8	4.0
Faridpur	585	829	52.8	50.8	52.7	14.8	17.0	5.7	8.3
Jamalpur	501	709	49.8	50.3	49.8	12.2	13.5	4.4	4.9
Kishoreganj	528	857	39.2	39.6	39.2	10.7	11.6	4.3	4.8
Mymensingh	487	863	56.3	45.0	55.8	12.3	16.2	4.0	7.1
Tangail	633	801	44.9	57.6	45.5	9.6	16.1	3.2	6.3
Jessore	571	750	43.5	36.2	43.0	9.7	8.3	3.4	2.9
Khulna	541	717	39.2	49.6	41.5	9.0	12.8	3.2	5.0
Kushtia	522	1017	33.3	43.6	34.3	7.9	9.7	2.8	3.3
Bogra	520	817	46.0	44.3	45.9	13.0	15.6	5.4	6.7
Dinajpur	508	609	38.2	45.5	38.5	9.2	14.0	3.3	5.6
Pabna	545	760	46.9	46.4	46.9	11.3	12.1	4.1	5.0
Rajshahi	496	625	41.2	43.9	41.5	8.5	9.5	2.7	3.0
Rangpur	477	637	51.9	51.7	51.9	12.2	12.3	4.1	4.4
Sylhet	607	855	40.6	35.4	40.5	9.6	6.2	3.5	1.9
Bangladesh	44.9	43.3	44.7	11.1	11.2	4.0	4.2

Source: BBS, Poverty Monitoring Survey 1999.

The regional variations in poverty, however, do not indicate any significant geographical characteristics. The incidence of rural poverty is higher than national average in eight regions e.g. Barisal, Bogra, Faridpur, Jamalpur, Mymensingh, Noakhali, Pabna and Rangpur. In the case of urban poverty, the number of regions with higher than national average incidence of poverty is significantly higher -- 14 out of 21 regions. These include: Barisal, Bogra, Chittagong Hill Tracts, Dinajpur, Faridpur, Jamalpur, Khulna, Kushtia, Mymensingh, Pabna, Patuakhali, Rajshahi, Rangpur and Tangail. The

results indicate that there are seven regions e.g. Barisal, Bogra, Faridpur, Jamalpur, Mymensingh, Pabna and Rangpur where the levels of incidence of both rural and urban poverty exceed their national averages.

TRENDS IN HUMAN POVERTY

At the macro-level, the relatively high incidence of poverty in Bangladesh is reflected in two indicators -- real GDP per capita and the human development index (HDI).¹⁵ The per capita GDP (at 1995 US \$) increased at a rate of 2.4 percent per year over the 1975 - 1998 period (Table 2.6). During the same period, the annual rate of growth of HDI value was 1.5 percent. It may, however, be noted that while the annual growth rate of per capita GDP has accelerated to more than 3 percent in the 1990s compared to 2 percent in earlier period, the growth rate of HDI value has declined -- from more than 1.5 percent for earlier period to 1.4 percent in the 1990s.

The human poverty index (HPI) of UNDP measures the distribution of progress in human development and shows the extent of human poverty.¹⁶ The HPI value has been estimated at 43.6 percent in 1998. This indicates that 55 million people in Bangladesh

Table 2.6 — Trends in Per Capita GDP and HDI Value

	GDP per capita (1995 US \$)	HDI value
1975	203	0.329
1980	220	0.348
1985	253	0.381
1990	274	0.412
1998	348	0.461

Source: UNDP 2000.

¹⁵ The HDI value gives the overall progress in achieving human development in three basic dimensions measured by life expectancy, educational attainment and income. See UNDP 2000.

¹⁶ The HPI is a composite index of deprivation in three basic dimensions of human life: a long and healthy life, knowledge and economic provisioning. For details on the indicators and computation methodology, see UNDP 2000.

lived in human poverty in 1998 compared to 59 million who lived below the income poverty line.

TRENDS IN INEQUALITY

The nature of impact of economic growth and other macroeconomic changes on poverty is influenced by changes in the distribution of income and consumption. In Bangladesh, the inequality in the distribution of consumption is lower than that of income which in turn is much lower than inequality in wealth.¹⁷ Available evidence indicates that relative inequality has increased over time in both rural and urban areas in the country as measured by the Gini coefficient of income distribution (Table 2.7). The inequality is higher in urban than in rural areas. In general, relative inequality widened in both rural and urban areas until the mid-1990s after which some decline in inequality was observed.

Table 2.7 — Relative Inequality in Income Distribution

	(Percent)	
	Gini coefficient	
	Rural	Urban
1983/84	35.0	37.0
1988/89	36.8	38.1
1991/92	36.4	39.8
1995/96	38.4	44.4
1997	39.0	43.0
1999	36.0	42.0

Source: BBS 1998, 2000.

¹⁷ Although information on inequality in wealth is scanty, the ownership pattern of productive assets reveals marked variations across rural and urban areas as well as among the poor and nonpoor households. The value of assets per urban household is estimated at almost three times that of rural household on average. For the non-poor households, the average asset value is nearly 200 percent higher in the rural areas compared to that of the poor. In urban areas, the disparity is much higher: the average asset value of the nonpoor is five times that of the poor. One of the major factors that contribute to less inequality in expenditure distribution compared to income distribution is the higher dependence of the poor households on subsistence production and greater access to common property resources. See Mujeri 2000.

Urban inequality increased more than rural inequality over the years and the disparity between rural and urban areas widened sharply during the 1990s (World Bank 1998). It may, however, be noted that the period of 1992-1996 which was associated with sharp increase in inequality (the Gini coefficient increased by nearly 6 percent in rural areas and 12 percent in urban areas) also witnessed rapid decline in incidence of poverty at a rate of 2.5 percent per year -- nearly 2 percent in rural areas and 6 percent in urban areas.¹⁸ The evidence, nevertheless, points out that a significant potential of the growth process in reducing poverty is lost in Bangladesh due to the inequalising nature of growth. A higher inequality generates a lower subsequent rate of growth in average income with reduced impact on poverty and a lower share of total and incremental income for the poor.

CHARACTERISTICS OF THE POOR

The poverty characteristics in Bangladesh are manifested in differences among the poor people. Several indicators e.g. physical and human resource endowments, demographic features and occupational groups are important in identifying the poor.

In rural areas, income of households depends on several factors e.g. land ownership and productivity of land, number of earning members, quality and composition of labour, nature of employment, and availability of infrastructure and other services to enhance the scope and return from income earning opportunities. The incidence of poverty is associated with poor human development indicators. Household heads with no education face a higher probability of being poor and poverty falls as the level of education increases.¹⁹ The poverty status of the households is also determined by the

¹⁸ There is a strong evidence that inequality matters for poverty reduction and high inequality dampens the impact of growth on poverty. When economic growth is accompanied by rising income inequality, opportunities are missed for poverty reduction. See Bruno et. al. 1998, Ravallion 1997, Ravallion and Sen 1998, Mujeri 1999.

¹⁹ According to 1998 Poverty Monitoring Survey, 78 percent of household heads in 'never read' category are poor in urban areas compared to 13 percent having Secondary School Certificate or higher education. In rural areas, the corresponding figures are 54 percent and 14 percent. See BBS 1999.

occupation of household heads. Households headed by agricultural labourers and tenants have a high incidence of poverty as do non-agricultural casual workers and self-employed workers with little capital.²⁰ The rural people with non-agricultural occupations are better off. In the urban areas, households living in slums and squatters are generally poor although considerable differences exist among these households. In general, households headed by casual or manual labourers have a high incidence of poverty as do participants in the informal sector with little assets.

One of the significant dimensions that characterises poverty in Bangladesh is the existence of marked gender disparities among poor households. The female-headed households generally belong to the vulnerable groups among the poor. These households usually earn less income since poor women have low earning capacity and their wages are lower than male wages in the labour market. The economic well-being of poor women is constrained by their limited access to productive resources. There also exist gender differences in intra-household allocation of resources and a systematic gender bias in access to food, nutrition, health, education and other human development inputs.

The economic and social contexts of the poor reveal interaction of both market and non-market forces that affects their existence e.g. various components of production related activities and human resource status, household instability and vulnerability, crisis-coping capacity and other socioeconomic processes. Along with income-earning activities, the poor spend a significant proportion of their time and efforts in the pursuit of expenditure-saving activities which provide significant avenues for strengthening survival and crisis-coping abilities of poor households.²¹ As such environmental conservation and sustainable common property resource management to enhance productivity of ecological

²⁰ Among the landless in rural areas, 81 percent are poor while only 18 percent of large landowners (with 7.5 acres or more land) are poor. See BBS 1999.

²¹ The Poverty Monitoring Surveys indicate that expenditure saving activities contribute nearly 20 percent to the annual income of rural poor households. See BBS 1998.

reserves have significant poverty-alleviating role in Bangladesh through expanding the scope of expenditure-saving activities of the poor.

The process of vulnerability of the poor, an important element of poverty characteristics in Bangladesh, operates through relatively high incidence of crisis among poor households e.g. crop losses, natural disasters, economic risks and uncertainties, illness and death of income earners, lack of socioeconomic security and other life-cycle and social events.²² While such crisis-events are often recurrent in nature, an important implication of these events is the risk of income erosion of poor households both through crisis-related expenditures and reduction in income-earning capabilities.

The poverty characteristics in Bangladesh highlight the multidimensional nature of the process suggesting the need to adopt a comprehensive approach to poverty reduction. The anti-poverty policies require creation high economic growth and a structure of growth that has a strong capacity to strengthen the channels through which the benefits of growth reach the poor. This requires actions on a broad front to enhance the 'voice' of the poor and provide better access to them within a wider set of asset framework: physical assets to increase productivity and income; human assets to enhance capabilities and take advantage of new opportunities; financial assets to undertake productive livelihood options; natural assets to ensure sustainability and diversity of income streams; social assets (e.g. through grassroots mobilization) to enhance networking capacity; and political assets (e.g. through empowerment and participation) to

²² The incidence of crisis for the poor is higher compared to the non-poor in both rural and urban areas in the country. Moreover, the poor households reveal marked inadequacy in crisis-coping capacity and face higher risks of income erosion. Actions to support capacity building to protect the poor against shocks and increase their access to resources and markets are important for poverty alleviation in the country. See BBS 1998.

strengthen their bargaining strength to compete with other interest groups and ensure access to resources and public services.

3. AGRICULTURAL GROWTH - POVERTY LINKAGES

After independence in 1971, Bangladesh followed the course of planned development with a major thrust to the public sector. While agricultural production remained with millions of small farms, the procurement and distribution of modern inputs and ownership of irrigation equipment were controlled by the Government. The reversal of the policy of state control started in 1975 with privatization of small scale enterprises, removal of restrictions on private sector investment in the manufacturing sector, and trade liberalization measures. A comprehensive programme of stabilization and economic reforms started in the mid-1980s with the aim to create an open, liberalized and market-oriented economy. The process involved a significant array of reforms, deregulation and structural adjustment measures to facilitate the globalization of the economy.²³ The underlying premise of reforms was based on standard arguments: improved external competitiveness and wider integration of the national economy with the global economy enhance efficiency and create the scope to reap the benefits of export-led growth which can sustain faster economic growth (Romer 1986, Lucas 1988, Rodrik 1995, Edwards 1998). The economy-wide reforms and adjustments included measures involving fiscal, financial, trade and industrial policy reforms; public resource management; privatization, and institutional and sectoral reforms. More specifically, the reform programme aimed at liberalizing foreign trade and exchange rate regimes, strengthening fiscal and monetary management and encouraging private sector participation in development. The current policy initiatives emphasise the pursuit of the reform agenda to promote both internal and external competitiveness and adjust to changes in the global economy.

²³ For details on evolution of economic reforms and structural adjustment programmes see Sobhan 1991, Mujeri et. al. 1993, Rahman 1993.

Table 3.1 — Annual Growth Rates of GDP

	(Percent)			
	1984-1999	1984-1992	1992-1996	1997-1999
GDP	4.4	3.9	4.6	5.4
Agricultural GDP	2.3	2.0	1.2	4.8
Non-agricultural GDP	5.7	5.2	6.5	5.9
Per capita:				
GDP	2.5	1.9	2.6	3.8
Agricultural GDP	0.4	0.1	-1.1	2.4
Non-agricultural GDP	3.6	3.2	4.1	4.5

Note: The growth rates are expressed at constant 1984/85 prices.

Source: Author's calculations.

It is widely recognized that growth-enhancing public policies are essential for sustainable poverty reduction in Bangladesh.²⁴ It is pertinent, therefore, to examine: what has been the relationship between economic growth and poverty in Bangladesh? The average rate of GDP growth during 1984-1999 has been 4.4 percent per year (Table 3.1). There has been variation in GDP growth rate over different sub-periods, which increased from 3.9 percent per year during 1984-1992 to 5.4 percent in 1997-1999. The variation has largely been due to fluctuations in agricultural GDP -- from 1.5 percent per year during 1992-1996 to 4.8 percent during 1997-1999. The growth rate of non-agricultural GDP is relatively stable. The per capita GDP increased at a rate of 2.5 percent per year over the entire period -- 0.4 percent for agricultural GDP and 3.6 percent for non-agricultural GDP. The growth rate of per capita GDP accelerated to nearly 4 percent per year during 1997-1999 from 1.9 percent in 1984-1992. The per capita GDP originating in agriculture remained mostly stagnant in the 1980s and experienced a decline until the mid-1990s. The 1997-1999 period, however, experienced rapid increase in per capita

²⁴ The Fifth Five Year Plan (1997-2002) envisages a 5.6 percent yearly growth in per capita income to substantially reduce the incidence of poverty by 2002. The targeted annual growth of GDP is 7 percent during the Plan period. See Planning Commission 1998.

agricultural GDP at a rate exceeding 2 percent per year. A comparison of the growth rates, particularly over different sub-periods, with annual changes in incidence of poverty (see Table 2.2) reveals some links between growth and poverty. The incidence of poverty increased during the 1984-1992 period due to increase in rural poverty when the growth rates of both GDP and per capita GDP were relatively low (3.9 percent and 1.9 percent respectively). The period also witnessed a relatively low rate of agricultural growth. Other sub-periods, despite increasing per capita GDP, witnessed slow decline in poverty. It is, therefore, important to analyze why poverty declined slowly despite economic growth achieved during the period.

While data limitations do not permit us to conduct any rigorous analysis into the nature of relationships between economic growth and poverty, available evidence points to several factors which constrain the capacity of economic growth to reduce poverty in the country. It is clear that an average rate of growth of around 4 percent per year is not rapid enough to make any significant impact on poverty.²⁵ There also exist examples where no direct relationship between economic growth and poverty reduction seems to exist.²⁶ This suggests that high economic growth is not always sufficient to ensure that benefits of growth will reach the poor to initiate a process of rapid poverty reduction in a country. Along with a high rate, structure of economic growth is important which determines the mechanisms through which benefits of growth are transmitted to the poor.

AGRICULTURAL GROWTH AND POVERTY

In terms of structure and sectoral composition of economic growth, the poverty alleviating role of agriculture is often emphasized in Bangladesh (Mujeri 1999, World

²⁵ The experience of Southeast Asian countries e.g. Malaysia, Thailand and Indonesia before the East Asian crisis may be cited. These countries experienced relatively high growth rates with decline in both the proportion and absolute number of the poor.

²⁶ One may note the case of China where, despite relatively high economic growth since the late 1980s, success in poverty reduction has been less spectacular compared to earlier periods when economic growth was low.

Bank 1998). The poverty profile, presented in Section 2, highlights that the poor in Bangladesh live mostly in rural areas and depend on agricultural activities. A resident in rural areas is also more likely to be poor. While this points to the importance of rural economic growth as the key to poverty reduction, the past pattern indicates that trend growth is higher in non-agricultural sector -- which are mostly urban based -- than in the agriculture sector.²⁷ The relative contribution of agriculture to GDP has been declining: the share of agricultural value added in GDP is around a quarter now compared to nearly 50 percent in the 1970s. The share of agriculture in employment, however, remains high with more than 60 percent of the employed labour engaged in agricultural activities. Given these structural characteristics, agricultural growth in Bangladesh has built-in advantages in accelerating economic growth and in promoting a structure of growth that has high capacity to reduce poverty. A high association between GDP growth and agricultural growth still exists despite decline in agriculture's relative importance.²⁸ The poverty trends and growth rates of GDP and agriculture over different sub-periods indicate that declining poverty in general is associated with relatively high GDP growth originating in agriculture although the association seems to have weakened in the 1990s (Table 3.2). During 1989-1992, for instance, poverty increased despite relatively high average agricultural growth. It may, however, be argued that a major factor which influenced poverty trends during the period was the devastating floods of the late 1980s.

An important issue that deserves attention is: how does agricultural growth help in raising incomes of the poor? One may identify several channels through which agricultural growth contributes to raising the poor's income. The impact of agricultural growth on rural wages is an important element in the process since, for the poor households, a major share of income originates from wage labour in agricultural and non-

²⁷ At constant 1984/85 prices, the annual growth rate is 2.3 percent in agriculture over the 1984-1999 period compared to 5.7 percent for non-agricultural GDP.

²⁸ The correlation coefficient between GDP growth and agricultural growth is estimated at 0.74 during the 1981-1999 period. See Mujeri 1999.

Table 3.2 — Poverty Trends and Agricultural Growth

Period	Poverty trends	Annual growth rate (percent)	
		GDP	Agriculture
1984 - 1986	Declining	4.2	2.5
1986 - 1989	Increasing	3.5	0.5
1989 - 1992	Increasing	4.2	2.6
1992 - 1996	Declining	4.6	1.2
1997 - 1999	Declining	5.4	4.8

Source: Author's calculation.

agricultural activities.²⁹ Along with positive impact on real wages, a high agricultural growth can create the synergy for diversification of the rural economy and development of the rural non-farm sector.³⁰ Rural diversification benefits the poor through higher labour demand and greater linkages with processing, transportation and other services. In Bangladesh, a rapid growth induced by agriculture is, therefore, likely to be more equitable with greater poverty reduction impact since the benefits of agricultural growth are more evenly distributed particularly in the labour market.³¹

The trends in wage rates of different categories of labour indicate that the real wage rate of agricultural labourers has mostly stagnated compared to other groups (Table 3.3). Despite technological change and growth of agricultural output, shifts in labour demand could not create much impact on real wages in agriculture. The counteracting growth of agricultural labour force is one of the major factors in depressing agricultural

²⁹ A recent survey indicates that agricultural and non-agricultural daily wages constitute 33 percent and 15 percent of the incomes earned by poor rural households in Bangladesh. See BBS 2000.

³⁰ The poverty alleviating impact of agricultural growth may, however, vary widely depending on its nature. In the Indian context, for instance, several factors e.g. inequality in endowments, market imperfections and low returns on agricultural assets have been highlighted which tend to constrain the 'trickle down' of benefits of agricultural growth to the poor. A large hard core of rural poverty could persist despite rapid agricultural growth. See Bardhan 1985, Gaiha 1995, Gaiha and Deolaliker 1993.

³¹ Based on 1991/92 and 1995/96 HES data, values of net elasticity of poverty with respect to per capita consumption growth in agriculture, industry and services support such a contention. The head count index of poverty in agriculture declines by 1.67 percent with 1 percent increase in per capita consumption of agricultural households. Similar declines are 1.26 percent in industry and 1.25 percent in services. The depth and severity of poverty also declines more with growth in agriculture than in other two sectors. See World Bank 1998. For evidence from India, see Ravallion and Datta 1996.

wages.³² Despite the stagnation, relationships between real agricultural wages and agricultural growth are observed. Out of nine years over the 1982-1998 period during which real wages increased, five were associated with increases in agricultural growth. Similarly, real wage declines in five out of six years were accompanied by declines in agricultural growth (Mujeri 1999). This suggests that sustained increase in agricultural wages requires accelerated growth in agriculture. Moreover, a relatively low rate of agricultural growth limits the capacity of Bangladesh agriculture to diversify with greater focus on higher value crops. The inequitable socioeconomic environment that persists in the rural society also constrains the ability of the poor (e.g. landless and marginal farmers) to derive proportionate benefits from technological changes.³³ The past experience indicates that, while agricultural growth matters for poverty reduction in Bangladesh, various processes that 'trickle down' the benefits to the poor have worked slowly creating less than anticipated impact on poverty.

Table 3.3 — Real Wage Rate Indexes of Different Labour Categories

Year	(1969/70 = 100)			
	General	Agriculture	Manufacturing	Construction
1983/84	90	75	95	99
1985/86	95	82	102	100
1988/89	107	92	110	120
1991/92	107	98	113	104
1995/96	114	104	123	105
1997/98	122	107	137	114

Source: Ministry of Finance 1999.

³² According to the Labour Force Survey, 34.5 million people are employed in agriculture which constitute more than 63 percent of the employed labour force in 1995/96. During 1985/86, the number of employed persons in agriculture was 17.5 million (57 percent of employed labour). See BBS 1998.

³³ In 1983-84, 6.4 million households (46 percent of rural households) were landless (owning less than 0.49 ac) and the number increased to 10 million (56 percent of rural households) in 1996. During 1996, small and marginal holdings (with less than 2.5 ac) accounted for 81 percent of the farms with 41 percent of operated land. See BBS 1999.

ROLE OF RURAL NON-FARM SECTOR

A significant aspect of the ongoing growth process in the country is the expansion of rural non-farm sector and associated changes in the labour market. The labour force has grown at a much higher rate than the growth of population and the demand for labour. During 1961 to 1991, total population increased by nearly 120 percent -- from 50.8 million to 111.5 million -- while the labour force grew from 16.9 million to 51.2 million -- an increase of 203 percent. In terms of employment, agriculture is the largest sector with more than 63 percent of total employed labour of 54.6 million in 1995/96 (BBS 1998). The bulk of recent employment generation has, however, taken place in the informal sector. Total informal sector employment increased from 45.3 million in 1989 to 47.9 million in 1995/96 accounting for nearly 60 percent of additional employment generation during the period. The informal sector, according to 1995/96 Labour Force Survey, provides 87 percent of total employment in the country indicating a process of growing informalization of the labour market. Moreover, more than 79 percent of those employed in the informal sector during 1995/96 are categorized as 'unpaid family workers' or 'self-employed'. It appears that several outcomes in the labour market e.g. characteristics of employment opportunities, pattern of sectoral employment, movement in real wage rates and the general failure to provide gainful employment opportunities to all types of labour have created conditions under which the growth process has not been sufficiently pro-poor to create significant impact on poverty situation in the country.

More importantly, growth of nonfarm sector does not seem to have led to any increase in the level of per capita rural non-farm income (Mahmud 1996). The evidence suggests that increasing landlessness in rural areas has largely pushed the rural labour force out of agriculture into low productivity self-employment activities in the nonfarm sector. In the event that nonfarm employment is a supplement to farm employment, even a low return from participation in nonfarm sector contributes to enhanced household income and consequent increase in the welfare of labour households. However, if

nonfarm employment is the only source of income of informal sector participants, which has largely been the case in Bangladesh, then expansion of informal sector dominated by traditional low productive activities provides subsistence to the participants without much improvement in the overall poverty scenario. The informal sector in the country reveals wide variations in productivity levels among different activities with low productivity of the dominant part of the sector. In effect, nonfarm sector in Bangladesh has emerged largely as a source of 'distress employment' for the poor. Enhancing the poverty alleviating role of the informal sector requires promotion of activities that are technologically efficient, economically productive and can respond to market demand.

4. DEVELOPMENTS IN FOOD SECTOR AND POVERTY IMPLICATIONS

To reduce poverty in Bangladesh, it is crucial to develop rural areas where most of the poor people live.³⁴ The development of the rural economy requires growth of agriculture and nonfarm sectors, improved coverage and quality of social services, improvements in rural institutions and expansion of rural infrastructure. The base of rural growth, however, rests with agriculture in which food sector plays the dominant role. The performance of food sector, and agriculture sector in general, has been influenced by past policy reforms -- both macroeconomic and sector-specific. The reforms in trade and exchange rate regimes had significant implications on agriculture sector along with changes in policies relating to markets for agricultural inputs e.g. HYV seeds, fertilizer, irrigation and pricing of agricultural products.

The incentive structures within agriculture, and between agriculture and nonagricultural sectors, have changed significantly over the years. Prior to liberalization of trade and exchange rate regimes, the macro-policy framework lowered the protection to agricultural commodities creating implicit taxation on the agriculture sector (Mujeri et. al 1993, Rahman 1993). With introduction of macroeconomic reforms and structural adjustment programmes, anti-agriculture bias has been reduced. In particular, the trade and exchange rate policy for the major crop, rice, is now considered largely neutral in determining domestic prices (Shahabuddin and Rahman 1998).

The agricultural policies, which evolved around direct involvement of the public sector, witnessed a reversal since the late 1970s that included privatization of input distribution, withdrawal of subsidies, import liberalization and broadening the scope of

³⁴ According to 1995/96 Household Expenditure Survey, nearly 82 percent of the poor live in rural areas. See BBS 1998.

private investment in agriculture. Over the years, liberalization of input and output markets has emerged as the dominant feature in agricultural policy reform. The deregulation of fertilizer marketing was completed in 1992 when the ban on private sector import of fertilizer was removed. Similarly, the Government eliminated all restrictions on import of minor irrigation equipment including standardization requirements. The process of liberalization also covered other agricultural inputs e.g. power tillers, seed and pesticides. Significant deregulation was also introduced with respect to agricultural pricing and distribution policies. The role of the Government in price stabilization is now limited to foodgrains (mainly rice) through domestic procurement and open market sales programmes apart from non-price targeted programmes (e.g. Food-for-Works and other food assisted interventions) for the poor and vulnerable groups. The reforms have resulted in increases in price incentives of rice and other agricultural products in recent years (Shahabuddin and Zohir 1995, Ahmed 1995). Some estimates attribute around 20-32 percent of the increase in rice production during the 1986-1992 period to reform measures, particularly to reforms in fertilizer use and minor irrigation development (Ahmed 1995). The privatization of fertilizer trade also reduced the cost of marketing. In real terms, irrigation water became cheaper after liberalization of the water market. The average water charge declined by 4 percent during the 1987-1994 period while the price of rice increased by about 30 percent (Hossain 1996).

The available evidence indicates that policy changes in agriculture have created positive impact: reforms in input market contributed to increased production, prices of irrigation equipment and other inputs declined, and the ownership of irrigation equipment increased for all categories of farms with no clear evidence of adverse distributional consequences.

Market oriented reforms and dismantling of various forms of state intervention along with reduced regulation and trade and price liberalization also led to an increase in agricultural growth. The post reform period witnessed changes in real exchange rates,

Table 4.1 — Impact of Reforms on Agriculture

	(Percentage change)
Agricultural output	36.3
Real GDP growth rate	34.2
Agricultural productivity growth	15.7
Real effective exchange rate	23.2
Real agricultural prices	-2.9

Note: The percentage change refers to five-year post reform period (1993/94-1997/98) compared with five-year pre-reform period (1981/82-1985/86). Agricultural productivity refers to crop value added per unit of land at constant prices. Real agricultural prices refer to index of wholesale price of agricultural products adjusted by GDP deflator. A positive change in real effective exchange rate indicates depreciation.

Source: Author's calculations.

increased real GDP growth rate, decline in real agricultural prices, and rise in agricultural output and productivity (Table 4.1). The rural poor, a large majority of whom are small agricultural producers, have benefited directly from these reforms.

PERFORMANCE OF CROP SECTOR

In Bangladesh, crop and horticulture is the dominant activity in agriculture although its share in total agricultural value added shows declining trends: 56 percent in 1999/00 compared to 66 percent in 1989/90 (Table 4.2). Within crop and horticulture, cereal production is the major activity which contributes around 70 percent of the sub-sector's value added. In cereals, rice contributes nearly 95 percent of total value addition. The growth rates of value added of different crops over the 1995/96 - 1998/99 period suggest that only three broad groups -- cereals, vegetables and other crops -- have consistently contributed to increasing value addition (Table 4.3). In case of paddy, the average growth rate is nearly 3 percent, despite negative growth in 1997/98.

Table 4.2 — Sub-sectoral Composition of Agricultural Value Added

	(Percent, constant 1995/96 prices)			
	1989/90	1994/95	1996/97	1999/00 ^a
Crop & horticulture	65.5	59.3	58.8	55.7
Animal farming	12.6	13.2	12.7	12.2
Forest & related activities	7.1	7.5	7.4	7.6
Fishing	14.8	20.0	21.1	24.5
Total agriculture	100	100	100	100

Note: ^a Provisional

Source: Bangladesh Bureau of Statistics.

Table 4.3 — Growth in Value Added in Crop Sub-sector

	(Percent, constant 1995/96 prices)				
	Average 1990/91-1994/95	1995/96	1996/97	1997/98	1998/99
Cereals	-1.42	3.78	7.57	0.07	1.63
of which:					
Paddy	-1.43	3.53	7.67	-1.05	1.40
Wheat	7.11	9.98	6.20	24.67	5.86
Beverages	2.23	3.84	2.91	-0.35	-2.17
Fibres	3.13	-22.40	18.74	19.31	-22.77
Fruits	0.43	1.05	0.41	0.28	-6.04
Oilseds	1.71	-1.21	1.71	1.32	17.03
Pulses	0.70	-0.94	0.28	-1.56	-2.21
Spices	-0.08	-0.61	0.81	0.04	96.22
Sugarcane	0.13	-3.77	4.96	-1.72	-5.50
Vegetables	3.77	2.29	2.28	3.58	12.42
Other crops	1.78	1.39	0.15	1.98	2.99
All crops	-0.48	1.71	6.42	1.02	3.11

Source: Bangladesh Bureau of Statistics.

Table 4.4 — Share of Foodgrain in Acreage and Gross Value of Production

	(Percent)							
	1973-1980		1981-1990		1991-1995		1997-1998	
	Acreage	Gross production value						
Foodgrain	74.7	67.8	77.9	72.4	78.8	75.1	78.7	69.9
of which:								
Rice	73.3	66.8	73.9	69.5	74.3	72.5	73.3	65.9
Wheat	1.4	1.0	4.0	2.9	4.5	2.9	5.4	4.0
Non-foodgrain	25.3	32.2	22.1	27.6	21.2	24.9	21.3	30.1
All crops	100	100	100	100	100	100	100	100

Source: Bangladesh Bureau of Statistics.

The share of different crops in total acreage and gross value of production indicates the dominance of foodgrain and its increasing importance (Table 4.4). The share of foodgrain in total acreage increased from 75 percent in the 1970s to 79 percent by early 1990s. The monoculture of rice is predominant which accounts for nearly three-quarters of total acreage.

Bangladesh achieved impressive gains in rice and wheat production since the 1970s mainly through increasing fertilizer use, investing in irrigation and adopting HYV seed varieties. The trends in area under cultivation, production and yield rates of major crops are given in Table 4.5. The area under rice has remained stable at around 10 million hectares but production has increased due to two major factors: first, substitution of local varieties by HYVs during the three seasons -- *aus*, *aman* and *boro*; and second, increase in area under *boro* rice which has relatively higher yield compared to other two varieties. The area under *boro* in total rice area increased from 24 percent in 1989/90 to around 35 percent in 1998/99 while its share in production increased from 35 percent to 53 percent over the same period.

Table 4.5 — Trends in Area, Production and Yield of Major Crops

	1989/90	1995/96	1997/98	1998/99
A. Area (thousand hectare)				
Rice	10,479	9,942	10,262	10,116
of which:				
Aus	2,263	1,542	1,565	1,424
Aman	5,704	5,647	5,808	5,165
Boro	2,511	2,753	2,889	3,527
Wheat	592	701	805	882
Pulses	738	698	643	547
Oilseeds	574	554	561	512
Spices	148	143	144	251
Sugarcane	187	174	175	174
Jute	542	459	577	478
Potato	117	132	136	245
B. Production (thousand metric tons)				
Rice	17,864	17,687	18,862	19,905
of which				
Aus	2,488	1,676	1,875	1,617
Aman	9,209	8,790	8,850	7,736
Boro	6,167	7,221	8,137	10,552
Wheat	890	1,369	1,803	1,908
Pulses	512	525	519	417
Oilseeds	432	741	483	448
Spices	323	318	316	395
Sugarcane	7,423	7,165	7,379	6,951
Jute	812	739	1,057	811
Potato	1,066	1,492	1,553	2,762
C. Yield (metric ton/hectare)				
Rice	1.70	1.78	1.83	1.98
of which				
Aus	1.09	1.09	1.19	1.14
Aman	1.61	1.56	1.53	1.51
Boro	2.45	2.62	2.82	2.99
Wheat	1.51	1.95	2.25	2.27
Pulses	0.69	0.74	0.82	0.77
Oilseeds	0.77	0.84	0.86	0.86
Spices	2.17	2.22	2.20	1.58
Sugarcane	39.78	41.07	42.11	39.96
Jute	1.51	1.61	1.83	1.71
Potato	9.14	11.27	11.39	11.29

Source: Bangladesh Bureau of Statistics.

FOOD PRODUCTION AND POVERTY IMPLICATIONS

Ideally, poverty implications of developments in food sector should be explained in terms of explicit relationships of the determinants of poverty and the links of these

determinants with indicators in the food sector. Since such an exploration is beyond the scope of the present exercise, we shall confine ourselves to examining some relationships between poverty indicators and food sector performance.

An important point to note in the context of Bangladesh agriculture is that the growth of agricultural output has barely kept pace with growth of population. The result has been a stagnation in per capita output which is revealed by the following alternative indices computed for the period 1981-2000:

$$\begin{array}{llll}
 \ln \text{ PCFP} & = & 4.525 + 0.0026 T & R^2 = 0.097 \quad \dots \quad \dots \quad \dots \\
 (1) & & (1.39) & \\
 \ln \text{ PCVA} & = & 4.562 + 0.0030 T & R^2 = 0.214 \quad \dots \quad \dots \quad \dots \\
 (2) & & (2.22) & \\
 \ln \text{ PCAP} & = & 4.516 + 0.0060 T & R^2 = 0.567 \quad \dots \quad \dots \quad \dots \\
 (3) & & (4.85) &
 \end{array}$$

where PCFP = index of per capita food production, PCVA = index of per capita value added in agriculture, PCAP = index of per capita agricultural production, T = time trend, and the terms in parentheses refer to t values.

The stagnation is particularly evident in per capita food production and value added which parallel the observed lack of any significant improvement in the incidence of poverty, particularly in rural areas. At the regional level, the relationship between incidence of poverty and agricultural performance has been examined through regression analysis.³⁵ For the purpose, three measures of poverty -- head count ratio, poverty gap and squared poverty gap -- have been used. The explanatory variables refer to growth in

³⁵ The regions refer to 21 old districts of the country for which disaggregated poverty statistics are available from the 1999 Poverty Monitoring Survey of the BBS.

Table 4.6 — Regional Growth Performance and Poverty - Regression Results

	Explanatory variables					R ²
	Constant	GPTY	IPTY	GPAY	IPAY	
i) Head count index	53.702	-1.991 (2.090)	-0.042 (1.031)	-	-	0.196
	47.042	-	-	-1.258 (1.332)	-0.014 (1.014)	0.178
ii) Poverty Gap	13.177	-0.410 (1.750)	-0.012 (1.011)	-	-	0.164
	11.658	-	-	-0.275 (1.476)	-0.005 (1.049)	0.155
iii) Squared Poverty Gap	4.752	-0.089 (1.363)	-0.005 (1.005)	-	-	0.155
	4.266	-	-	-0.035 (1.231)	-0.002 (1.002)	0.141

Notes: The explanatory variables are: GPTY = per capita GDP growth, IPTY = index of per capita GDP in 1997/98 relative to national average as the base, GPAY = per capita growth in agricultural GDP and IPAY = index of per capita agricultural GDP in 1997/98 with national average as the base. The growth rates are measured at constant 1984/85 prices over 1981/82 to 1997/98.

per capita GDP and per capita agricultural value added over the 1981-1998 period and the index of per capita GDP and per capita agricultural value added in 1997/98 with the national average as the base.³⁶ Table 4.6 presents the results of the regression. As expected, the coefficients of the variables have negative sign indicating inverse relationship between growth and level of income and the measures of poverty. The coefficients are, however, not significant and the explanatory powers of the equations are low.

Moreover, the coefficients do not reveal greater poverty alleviating impact of improved agricultural performance relative to overall economic growth. What can we infer from these results? Although the results are not statistically strong, the indication of an inverse relationship between agricultural and overall growth and poverty is evident. The regions with relatively high level of per capita agricultural and total income and the

³⁶ The use of per capita growth in crop sector value added and the index of per capita crop value added also yield similar results.

regions which experienced more rapid growth in agricultural and other economic activities, also performed better in reducing poverty. While the analysis does not provide enough evidence to draw inferences about the complex causal mechanisms, the benefits of rapid agricultural and economic growth to the poor are apparent. Nevertheless, the low explanatory power of the regression equations suggests that there may be other factors at work in the rural economy which by themselves are important causal mechanisms of poverty. The scope of reducing poverty through raising agricultural and overall growth, therefore, crucially depends on how these factors operate to help reduce poverty. We have noted earlier that developments in the labour market have not led to increasing real wages benefiting the poor. Another important aspect which deserves attention is the changes in real consumption level of the poor and food prices which are likely to have significant poverty implications.

REAL CONSUMPTION, FOOD PRICES AND POVERTY

An important question relating to poverty in Bangladesh is: How do changes in real consumption and food prices affect the poor? While the poor are adversely affected by higher food prices in the short run, the longer term impact depends on adjustments in the economy resulting from higher prices e.g. linkage of wages to food prices and response of agricultural investment to intersectoral movement in terms of trade. For instance, if higher food prices lead to increased investment in food production and enhanced wages for agricultural labour, the poor could be better off despite higher prices.

The recent trends indicate that the relative price of food in rural areas has marginally declined since 1986/87 while, in urban areas, there has been an increase in the relative price (Table 4.7). The impact of changes in relative food prices on poverty should, however, be seen in terms of changing consumption patterns in rural and urban areas (Table 4.8). Since the 1980s, two major changes may be noted: shift in consumption pattern from cereals to noncereals within food and from food to nonfood. The above trends are stronger in urban areas. The proportion of expenditure on food

Table 4.7 — Trends in Relative Food Prices in Rural and Urban Areas

		(Percent)				
		1986/87	1991/92	1995/96	1996/97	1998/99
Measure 1						
Rural		101.3	100.1	99.0	97.9	100.2
Urban		101.1	100.5	101.2	100.1	104.8
Measure 2						
Rural		103.9	100.2	97.1	94.1	101.2
Urban		102.5	101.1	102.9	100.1	111.9

Note: Measure 1 gives the ratio of value of food component of consumer price index to value of consumer price index itself whereas Measure 2 provides the ratio of values of food component to nonfood component of the index. The rural and urban relative food prices are based on all rural and all urban consumer price indexes with 1985/86 as the base.

Source: Bangladesh Bureau of Statistics.

Table 4.8 — Distribution of Monthly Per Capita Consumption Expenditure

		(Percent)					
		Rural			Urban		
		1983/84	1991/92	1995/96	1983/84	1991/92	1995/96
Food		66.7	69.2	62.4	56.7	56.1	46.3
Of which:							
Cereals		38.0	35.9	29.8	25.6	21.7	14.4
Noncereals		28.7	33.3	32.6	31.1	34.4	31.9
Nonfood		33.3	30.8	37.6	43.3	43.9	53.7
Total		100	100	100	100	100	100

Source: Household Expenditure Survey, various years.

declined from 67 percent in 1983/84 to 62 percent in 1995/96 in rural areas while the decline was much rapid in urban areas: from 57 percent to 46 percent. Similarly, the share of cereals declined during the period -- from 38 percent to 30 percent in rural areas and from 26 percent to 14 percent in urban areas. However, in case of quantity of consumption of cereals, per capita intake increased in both rural and urban areas (Table 4.9). In rural areas, per capita cereal consumption increased by 8 percent during 1984-1996 period which was entirely due to increase in rice consumption which increased by

Table 4.9 — Average Daily Per Capita Intake of Cereals

	(Grams)					
	Rural			Urban		
	1983/84	1991/92	1995/96	1983/84	1991.92	1995/96
Total cereals	483	523	522	424	471	442
Of which:						
Rice	420	482	479	350	416	390
Others	63	41	43	74	55	52

Source: Household Expenditure Surveys, various years.

Table 4.10 — Balanced Nutrition and Actual Pattern of Food Intake, 1997

	Minimum balanced nutritional requirements ^a	(gm/capita/day)			
		Rural		Urban	
		Poor	Non poor	Poor	Non poor
Rice	390	425	506	392	386
Other cereals	100	30	59	43	79
Roots and vegetables ^b	225	165	226	171	226
Pulses	30	11	21	14	24
Edible oils	20	7	13	11	26
Spices	10	24	40	38	45
Fruits	50	5	23	8	65
Sugar & gur	10	6	17	6	21
Fish	45	21	42	21	54
Meat & poultry	34	6	29	13	51
Milk & milk products	30	10	41	13	63
Total	944	710	1017	730	1040

Notes: a As specified by Bangladesh National Nutrition Council.

b Also include miscellaneous items not included in other categories for 1997.

Source: BBS, Poverty Monitoring Survey 1997.

14 percent. In fact, consumption of non-rice cereals declined. Similar trends also exist in urban areas. One may also note large differences in food intake between the poor and the nonpoor in both rural and urban areas compared to minimum balanced nutritional requirements (Table 4.10). For cereals, total intake of the poor is less than minimum requirement but the entire deficit is due to low intake of non-rice cereals. The intake of

non-rice cereals for the nonpoor in both rural and urban areas is also less than the minimum requirement.

In case of rice, the actual intake of the poor and the non-poor in both rural and urban areas exceeds the minimum requirements for a balanced diet. Two contrasting trends in rice consumption may, however, be noted. First, in rural areas per capita consumption of rice is higher for both the poor and the nonpoor than these groups in urban areas and the consumption of rice is likely to increase as people move out of poverty in rural areas -- the average rice consumption of the nonpoor is nearly 20 percent higher than the poor in rural areas. Second, food consumption pattern is less rice-intensive in urban areas for both the poor and the non-poor. Hence the trend of accelerated pace of urbanization in the country is likely to have a moderating impact in total rice consumption. The actual intake of several items e.g. pulses, edible oils, fruits, meat and poultry (which are rich in protein and provide balanced nutrition) is, however, much lower than minimum requirements. The intake is worse for the poor in both rural and urban areas. This suggests the need of the agricultural production system to adjust to the pattern of demand which requires substantial diversification into non-rice crops.

With respect to changes in food prices, households who are net purchasers of food are likely to be affected. The urban households are usually net purchasers but a substantial percentage of rural households also belongs to the category. There exist no direct statistics on the number of net producer or consumer households in rural areas, but some anecdotal evidence can be presented. According to the 1996 Agricultural Census, 29 percent of rural households either do not own homestead land or own homestead land but no cultivated land. These households are, therefore, net purchasers of food. Moreover, farm households with inadequate land are also dependent on the market for meeting their food requirements. A lower bound of nearly 87 percent of the rural households, consisting of non-farm and small farming households, can be taken as net purchasers of food among all rural households (Table 4.11). Even some of the medium farmers who have small marketable surplus may be affected by changes in food prices

Table 4.11 — Distribution of Rural Households by Land Status

Land status	Number (million)	Percent	Operated area/household (acre)
Non-farm households	6.03	33.8	0.09
Small farm holdings	9.42	52.8	0.87
Medium farm holdings	2.08	11.7	3.99
Large farm holdings	0.30	1.7	11.61
Total	17.83	100	1.15

Notes: Non-farm households include households with no operated area and with cultivated area not exceeding 0.05 acres. Small, medium and large farm holdings are defined as those having 0.05 to 2.49 acre, 2.50 to 7.49 acre and more than 7.50 acres of land respectively.

Source: BBS, 1996 Agricultural Census.

since they typically sell the surplus after harvest when prices are likely to be low and purchase food during the lean season when prices are high. It is evident, therefore, that the vast majority of the households in the country are net purchasers of food and adverse price fluctuations affect the poverty status of the resource-poor households.

FUTURE AGRICULTURAL GROWTH PERSPECTIVES

For sustaining rapid growth and poverty reduction, the 'business-as-usual' scenario of agricultural growth is clearly not enough for a number of reasons. With population growth, agricultural output must expand to maintain stable food prices, generate higher farm incomes and achieve food security. The coming years are also likely to witness a changing pattern of demand for different food items that would affect the market, relative prices and the incentive structure governing agricultural production decisions by the farmers.

During the coming decades, two dominant factors are likely to influence the structural change and growth pattern of agriculture in Bangladesh: declining rate of

population growth and accelerated growth in per capita income.³⁷ In the past, the demand for agricultural output was determined by high population growth and a slow growth in per capita income. The consumption pattern, as a result, did not reflect much the differential growth in the demand for agricultural products. In contrast, income-induced pattern of demand for agricultural products is likely to emerge as the major determinant of future consumption of agricultural products in the country. With income growth, along with a declining income elasticity of demand for all agricultural products, the demand pattern of specific agricultural markets would be different due to varying income elasticities. This would imply a lower growth in demand for cereals and a strong market demand for noncereal crops and noncrop agriculture. Some estimates suggest that a 10 percent increase in per capita income of rural households increases demand by 16 percent for livestock products, 8-9 percent for fish and edible oils, 5-6 percent for potato, vegetables and pulses, and by 2 percent for rice and wheat (Hossain and Shahabuddin 1999). With urbanization, the expenditure pattern also changes: urban households spend a relatively smaller share of income on food than rural households. Further, the demand for noncereals by urban households is stronger than rural households.

What could be the implications of future likely developments in demand on required growth and structural changes in agriculture? The issue is examined here in terms of broad indicators of production requirements in order to highlight the strategies that would be needed to generate appropriate signals to the producers for resource re-allocation and production decisions commensurate with expected market demands. The exercise adopts a time horizon upto the year 2007.

³⁷ The annual growth rate of population declined from around 2.5 percent in the 1980s to 1.6 percent in late 1990s and the target is to achieve NRR = 1 by the year 2005. The growth rate of per capita GDP has increased from less than 2 percent per year in the 1980s to around 4 percent in late 1990s.

Despite decline in population growth rate, total population of Bangladesh will increase to about 143 million in 2007 from the current level of 130 million. The share of urban population will also increase: from 25 percent at present to around 33 percent in 2007.³⁸ With such a rapid demographic transition and likely income growth, the organization and structure of agricultural production would require substantial adjustments. For instance, some projections based on 1995/96 Household Expenditure Survey indicates that with unchanged relative prices and at an average GDP growth rate of 8 percent per year, consumption of pulses, edible oils, sugar and gur, fish, meat and poultry is likely to increase at much faster rates than cereals and other foods (Table

Table 4.12 — Projected Growth and Consumption of Selected Agricultural Products

	1995/96 (gm/capita/day)		Percentage change (1996-2007)		Estimated Consumption, 2007 (million metric tons)
	Rural	Urban	Rural	Urban	
Rice	479	390	3.3	1.3	24.2
Other cereals	43	52	4.7	32.7	2.8
Pulses	13	19	76.9	36.8	1.3
Edible oils	8	17	75.0	47.1	0.9
Potato	47	64	25.5	7.8	3.3
Vegetables	167	171	6.6	7.0	9.4
Spices	36	45	5.6	15.6	2.2
Sugar & gur	9	10	88.9	80.0	0.9
Fruits	25	39	8.0	35.9	1.9
Fish	42	52	14.3	40.4	2.9
Meat & poultry	12	30	91.7	36.7	1.5
Milk	30	42	26.7	4.8	2.1
Total	911	931	10.1	12.1	...

Source: Author's calculations.

³⁸ For details, see Mujeri 2000.

4.12).³⁹ The total consumption of foodgrains (rice and other cereals) is likely to increase to about 27 million metric tons.⁴⁰ This would require a gross production of about 30 million tons (allowing 10 percent deduction for seed and wastage). With an estimated production of 24.33 million tons in 1999/00, this implies that foodgrain production needs to grow at an annual rate of around 3 percent to meet the demand from domestic sources. What is more significant for future agricultural growth is the rapid growth of output of noncereal crops and noncrop agriculture that would be needed to meet the changing pattern of demand and for achieving balanced nutrition.

³⁹ An application of Food Characteristics Demand System for estimation of demand parameters in Bangladesh indicates high income elasticities for products like fish, beef, milk and vegetables. With increase in income, effective demand for these products will increase at a rapid rate compared to cereals. This indicates the need to adopt policy interventions to bring structural change in the pattern of existing food production in the country. See Razzaque, Khondker and Mujeri 1997.

⁴⁰ Some recent medium-term projections of foodgrain demand suggest similar magnitudes. Assuming constant per capita consumption of 16 oz/capita/day, and assumed population growth rate of 1.5 percent during 2000-2010, total demand for foodgrain is estimated at 25.4 million tons in 2004/05 and 27.4 million tons in 2009/10. For income induced consumption with an income growth of 6 percent, projected foodgrain demand is 27.9 million tons and 29.3 million tons for low and high income elasticities respectively in 2004/05. Similar magnitudes for 2009/10 for low and high income elasticities are 30.6 million tons and 31.9 million tons respectively. See Shahabuddin and Zohir 1995.

5. SUMMARY AND POLICY IMPLICATIONS

The characteristics of poverty and growth linkages in the Bangladesh economy indicate that rapid agricultural growth is necessary in accelerating economic growth and creating a structure of growth that has a high capacity to reduce poverty. The past performance of agriculture, influenced by two major factors, points the need to reconsider the strategies in view of emerging development in the agriculture sector. *First*, policy reforms – both macroeconomic and sector specific – have initiated significant changes in incentive structures within agriculture and between agriculture and nonagriculture sectors. The empirical evidence indicates that the policy changes, on the whole, have created positive impact and contributed to increased production. The reform agenda, however, has fallen short of targets in certain cases due to several factors e.g. lack of social consensus, incomplete and selective implementation, backsliding of the reform process, inadequate design and sequencing of reforms, emphasis on achieving quantitative targets without facilitating institutional reforms, and politicizing of the reform agenda. Sustained improvements in agriculture require the Government to pursue pragmatic reforms and adopt a set of clearly defined criteria, based on priorities of agricultural development and sound economic rationale for public sector involvement, for allocating public resources and mobilizing private initiatives. *Second*, while the past focus of policies on cereals (e.g. rice) has paid large dividends, it is unlikely to provide a sustainable engine of agricultural growth in future. The emphasis in agricultural policy needs to incorporate noncereal crops and noncrop agriculture for ensuring growth of an integrated and dynamic agriculture to supply necessary food stuff for a balanced diet of the population, generate exports and create the foundation of a modern economy.

In order to promote desirable trends, future agricultural development strategy needs to put emphasis on two key elements: exploitation of economies of scale along

lines of comparative advantage, and acceleration of investment embodying technological innovations. Sustained agricultural growth requires action in three areas:

- intensification of production of existing crops (e.g. rice);
- diversification of agricultural production to high return crops having comparative advantage; and
- improvements in noncrop agriculture.

The intensification of agriculture, as a source of growth, needs to come through increased yields and higher cropping intensity. The yields can be raised substantially for all crops by developing better varieties, adapting new and high-yield varieties, improving extension system, using balanced and efficient fertilizer, and incorporating better soil and water management. The scope for increasing cropping intensity exists mostly through expanded irrigation. Crop diversification needs adoption of several measures: intensification of rice production to release land and other resources; specific targeting of flood-free uplands for vegetables, spices and other crops; incorporation of pulses, oilseeds and fodder crops in rice based farming system; emphasis in rice research on shorter maturity HYVs; promotion of agri-business and agro-processing along with preservation and quality control; investment in transport and communication infrastructure and information network. In the medium term, with expected increase in the demand for cereals, crop diversification in Bangladesh does not necessarily mean a substitution out of cereals (rice) rather crop diversification needs to be promoted as a systematic arrangement for growing a variety of crops in rotation with rice. The noncrop agriculture provides a large potential for development in Bangladesh: growth of noncrop agriculture has a marginal trade-off in terms of land and other resources with crop production along with significant income generation and poverty reduction impact. Rapid and sustained growth of non-crop agriculture (e.g. animal farming and fishing) requires emphasis on

increasing per unit of production through improved and effective management and organization of production, processing and marketing systems.

The realization of under-exploited growth opportunities in agriculture requires increased public investments in several key areas e.g. research, extension, seed development, crop diversification, marketing linkages and information networking, soil fertility and fertilizer use efficiency, agro-processing and agri-business development, and integrated area and farming systems development. The public sector is also required to promote and support private investment in agriculture and create an enabling condition under which private investment can maximize its contribution to agricultural development. It is necessary to better manage the resource base, technology adoption process and agronomic potentials at both aggregate and disaggregate levels. For the purpose, the production strategy requires policies, incentives and programmes to:

- ensure accelerated growth of agricultural productivity;
- create opportunities to pursue efficient production practices;
- remove supply side constraints;
- encourage adequate demand for additional outputs; and
- provide a supportive macro and trade environment.

The need is to increase the competitive edge and accelerate the pace of transition from subsistence to commercial agriculture. A viable and dynamic agriculture will make significant contribution to sustained poverty reduction in Bangladesh.

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