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Rural Economy, Agriculture and Poverty Reduction Nexus in Bangladesh

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1. INTRODUCTION

Let me begin my presentation giving reference to the connection between agricultural growth and reduction in rural poverty in Bangladesh, which has been much debated and has profound implication for academic discourse as well as in the formulation of public policies. In this country, 74 % people live in rural areas and agriculture contributes about a quarter of GDP, brings one-third of export earnings and provides employment to two-thirds of civilian labour force. Yet, it is not uncommon to find pessimistic projection that agricultural growth in Bangladesh is unlikely to accelerate enough to raise rural incomes substantially and reduce rural poverty as rapidly as expected, implying that most growth in employment and income will come from industry and services (McIntire, 1998; World Bank, 1999). World Bank vision also shows that high growth required for poverty eradication, *elan vital*, will come not from agriculture, which the Bank does not expect to grow at more than 3.5 percent a year on a sustained basis (World Bank, 1998). This vision has already proved to be a narrow vision with agriculture growing at over 4 percent during the later half of 90s. However, there are also optimistic views that attaining high agricultural growth is possible in Bangladesh and that hinges largely on promoting more diversified cropping systems, rapid shift from crops to non-crop sub-sectors and strengthening linkages

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between agriculture and rural non-farm sectors (Ateng, 1998; Mahmud, 1998; Hossain, 1998). As Mellor (1996) rightly puts it, development strategies that puts more emphasis on the non-agricultural sector generally end up with rather slow rates of growth for both agriculture and non-agricultural sector and eventually fall far behind the countries that lay emphasis on both sectors or even focus primarily on agriculture.

The main purpose of this paper is to highlight the current level of understanding of the changes in rural economy, agricultural growth scenarios and rural poverty reduction in Bangladesh and draw major lessons for way forward. Section II identifies the recent changes in rural economy and agriculture, and section III discusses the growth trends in agriculture. The development of rural non-farm activities is dealt with in section IV. Section V discusses the relationship between agricultural growth and poverty reduction. The final section puts forward suggestions for way ahead.

2. CHANGES IN RURAL ECONOMY AND FARM STRUCTURE¹

The rural economy of Bangladesh has experienced significant structural changes during the recent decades (Table 1). **Firstly**, the land available for crop cultivation has been shrinking at about 1 percent per annum, which meant a reduction of average farm size from 0.81 hectare in 1983/84 to 0.61 hectare in 1996 with simultaneous increase in fragmentation and subdivision of holdings. **Secondly**, numerical dominance of marginal and small farms has increased as fast as 2.7 percent per annum, while those of the medium and large farms have actually fallen. Speaking numerically, this means that in future Bangladesh agriculture will have overwhelming dominance of small farms with even smaller number of medium farms and that there may not be any large farm according to the present definition.² It implies that production organization and also marketing functions of millions of very small farms under individualistic management is highly unlikely to remain economically viable. **Thirdly**, the number of agricultural labour households as a proportion of all rural households and number of farm holdings providing wage labour to other farms as a proportion of all farm holdings dropped between the two census years. This slow growth in farm labour supply

¹ This section and section III draw on author's earlier write up for joint papers by Mandal and Asaduzzaman (2002a; 2002b).

² As these trends continue, the average farm size will further decline to 0.34 hectare in the year 2015, when the incidence of poverty is targeted to be halved.

has not however affected crop sector output growth due to increased mechanization of irrigation, tillage and other crop operations. **Fourthly**, while the area cultivated per farm has declined, average homestead area per farm has increased from 0.08 to 0.09 acre, meaning somewhat increased opportunities for home-based non-farm activities. It is also important to keep in mind that many poor households have already used up most of their homestead lands for house construction and are left with very little opportunities for home-based vegetable, fruits and fish cultivation. **Fifthly**, land tenurial contracts are changing fast with fixed rent tenancy gaining prominence over sharecropping tenancy (Saha, 2001). **Sixthly**, a new form of contract i.e. share cropping with water has emerged whereby about a quarter of harvested Boro paddy is paid for supplies of pump irrigation water. There is also the case of reverse tenancy through which private tubewell owners lease in land from marginal/small farmers and absentee land owners to increase their irrigation command areas to more viable size (Mandal, 2000). **Seventhly**, while land area for field crop cultivation has declined, development of rural infrastructures has created a type of open access resources e.g. embankment/road side slopes, burrow pits, etc. Anecdotal evidence shows that in many places these are used for productive purposes such as pond aquaculture, rice-fish culture, cattle grazing and roadside tree plantation, although who gains and who loses access to these resources remains to be an open question.

3. GROWTH TRENDS IN AGRICULTURE

3.1 Crop Sector

Bangladesh agriculture grew on an average at 2.3 percent annually, rising over 4 percent per annum during the latter half of the 90s. The main impetus came from crops sub-sector, which accounted for 58 percent of total agricultural value added and grew at 2.2 percent annually over the decade. In the backdrop of -0.25 percent growth in the first half of the 90s, the crop sub-sector registered as high as 4.5 percent growth during the second half of the 90s (Table 2). The main source of crop sub-sector growth has been rice cereals, which demonstrated spectacularly high growth of 4.5 percent during the second half, as against 0.25 percent in the first half of the 90s. The overall growth of foodgrain sub-sector was 3.4 percent, which surpassed the population growth rate of less than 2 percent per annum (Planing Commission, 2001). Wheat, the second important cereal crop, showed an average annual growth of 11.7 percent during 1995/96 to 1998/99 (Mujeri, 2000).

In addition to rice and wheat, the area and output of vegetables grew at 4.47 and 4.44 percent respectively per annum during the 90s. In addition to growing demand for vegetables domestically, the main impetus seem to have come from technological improvement in vegetable cultivation and growth in vegetable exports market, although the volume and earning from vegetable exports showed a declining trend since the year of big flood in 1998. The production of fruits also grew moderately at around 1 percent per annum, although the production of fruits shows a somewhat declining trend in the recent years. While there has been significant growth in overall crop sector, pulses, oilseeds and sugarcane exhibited secularly negative growth rates in latter half of the 90s.

3.2 Non-crop Sector

There has been an increasing investment in non-crop sector, encompassing mainly livestock and fishery, but also forestry and floriculture etc. Livestock development, i.e. poultry and small-scale dairy sub-sectors, has sustained growth of 2.5 percent during the 90s. The liberalization of imports of livestock feeds, medicines and vaccines, day old chicks, discouraging import of powdered milk, etc has contributed markedly to the growth of this sector. Especially, poultry production both for meat and eggs has been very popular as homestead income generating activity and as large-scale commercial farming (for more elaboration see Asaduzzaman (2000). Fisheries sector growth has been consistently 8-9 percent per annum throughout the 90s, although a large proportion of the current domestic consumption of fish is met from import.³

3.3 Diversification and Commercialization in Agriculture

Bangladesh agriculture has experienced considerable diversification in response to technological shifts, market opportunities, changes in dietary habits, etc. **Firstly**, relative contribution of crop agriculture to GDP has been declining, while that of non-crop enterprises is gaining greater share. **Secondly**, monsoon dependent low-yielding Aus rice has been giving space to HYV boro rice production. **Thirdly**, significant diversification from rice to a number of non-rice crops is taking place. **Fourthly**, there has been a remarkable increase in the share

³ In addition to mostly illegal import of major carps from India, there are also anecdotal reports of availability of carps from Myanmar these days. After the adverse impact of importing poultry eggs from India in the mid nineties and of the recent “unfounded” scare of Afla toxin in the commercially produced poultry meat, legal or illegal importation of fishes from outside has the potential to thwart the growth of cultured fishery in the country.

of non-crop agriculture to GDP, especially in the poultry, small-scale dairy and pond fishery production. **Fifthly**, there has been some improvement to value addition to agricultural products, but it is far less than expected due to inadequate infrastructure, credit and fiscal supports.

3.4 Shift in Technological Base

Despite declining farm size, increasing land fragmentation and the alleged depletion of organic matter content in soil, the country has enjoyed a major upsurge in food grain production over the last two decades.⁴ The main driving forces behind this increase include the following:

Firstly, there has been a large-scale adoption of high-yielding varieties of rice and wheat. **Secondly**, intensive cultivation of HYV rice and wheat varieties has been possible due to rapid adoption of two important technologies- mechanized irrigation and tillage mechanization. There are however large variations between districts in terms of irrigation coverage relative to its potentials and development of irrigation water market.⁵ Similarly, in the last two decades, mechanized tillage practice gained prominence over ploughing by draft animals. **Thirdly**, as a result of the changes in technology and its variation by district cropping intensity varied substantially between districts from just about 1 crop (98.5 percent) to just about 2 crops (199.6 percent) a year. **Fourthly**, despite budgetary constraints agricultural research made commendable contribution to augmenting crop production, especially foodgrains and vegetables. Nevertheless, it is recognized that the research system is heavily tilted towards crop research, actually rice research, ignoring non-rice crops. The other prominent drawback is the treatment of the livestock and fishery research as the minor partners in the allocation of financial and manpower resources. The huge migration of good quality agricultural scientists from the country in recent years is also a part of the problem. **Fifthly**, although the New Agricultural Extension Policy (NAEP) has wider mandates of covering all categories of farmers, research-extension linkage still remains very weak, especially with respect to the involvement of private sector and NGOs.

⁴ During the nineties, foodgrain production grew at 2.35 percent annually, which was above the population growth rate during the same time.

⁵ For an exposition of Shallow Tubewell irrigation water market, see Mandal (2000).

4. DEVELOPMENT OF RURAL NON-FARM ACTIVITIES

The growth in crop and non-crop agriculture reinforced by increased flow of remittances to the countryside has led to the rapid growth of a wide range of rural non-farm activities (RNFA). These have developed as backward and forward linkages to agricultural growth and are classified as farm-oriented RNFA and other RNFA. The farm-oriented RNFA include rural manufacturing and trading of various farm machinery, concrete poles and sanitary equipment, animal feed, poultry vaccination, etc. The other category of RNFA is quite large and diverse, which includes wide range of services such as installation, operation, repair and maintenance services for farm equipment, rice milling, rural transportation, grain trading, shop keeping, carpentry, house building, saw milling, etc.⁶

RNF sector is emerging as a prominent growth engine of the rural economy. It contributed about 36 percent of total GDP at 1983/84 prices (Shilpi, 1998). RNF activities provided employment to nearly two-thirds of the rural workers and generated 52 percent of average rural household incomes at US\$ 1503 in 2000-01. The income from RNF activities increased at 6.8 percent, as against agricultural income growth of 1.4 percent per annum (Hossain, 2002).

The key linkages between RNFE and other sectors are through the rapid spread of irrigation, power tillers and input markets at the local level as a result of market liberalization policy. The rapid growth of rural mechanic services, engineering workshops, free market selling of fertilizers, pesticides and seeds accompanied the growth in RNF sector. The sustained growth of livestock sector, especially poultry farming, provided considerable impetus to the growth of RNF activities. The other key drivers of such change include rural electrification and rural road infrastructure, although their performances are yet to be improved as a precondition for further development of the RNF sector. Markets must be allowed to function better through removing barriers to entry into non-farm activities. The inadequacy of rural credit and financial intermediaries seriously limits the growth of rural non-farm activities, despite impressive growth of rural household incomes at 3.8 percent per annum and steady flow of rural remittances from abroad.

5. AGRICULTURAL GROWTH AND POVERTY SITUATION IN BANGLADESH⁷

The discovery of temporary 'slow downs' in agricultural growth first in mid-eighties and then 'stagnation' in mid-nineties, and attributing these as the effects

⁶ For a detailed typology and discussion of rural non-farm activities, see Mandal and Asaduzzaman 2002a).

⁷ This section and section VI draw on author's joint paper with R.W. Palmer-Jones (2000).

of aid-sponsored liberalization policies subsequently deemed largely inappropriate and harmful. Despite policy restrictions in mid-eighties and increasing cost of pump irrigation due to longer drought spell in mid-nineties reducing growth of irrigation and related technological development, longer-term trend has remained surprisingly strong (Palmer-Jones, 1999). In addition to gearing up domestic food grain production, considerable improvement in food management has also been demonstrated, especially in the post 1998 flood years.

But, what impact has the observed agricultural growth had on poverty reduction in Bangladesh? Poverty data are patchy and do not always explain how poverty lines have been estimated. A recent World Bank (2002) estimate of headcount rate using CBN poverty measures on the basis of HIES 2000 shows that the incidence of rural poverty (assuming upper poverty line) dropped from 61.2 percent in 1991-92 to 53 percent in 2000. The incidence for lower poverty line dropped from 46 percent to 37.4 percent. This means that there has been hardly a percentage point reduction per year in rural poverty, although one can argue that the increased agricultural growth has contained the incremental population growth of about 1.7 percent per annum. The reduction in urban poverty was a little slower during the period.

Independent estimates of poverty have all shown that there appear to have been substantial reductions in poverty in the eighties and nineties. In addition to the World Bank estimates, along with other estimates based on Household Expenditure Survey data, the rice wage arguably provides a robust indicator of trends in absolute poverty, at least for the hard core poor in Bangladesh. Recent data displayed in Table 3, show considerable year to year fluctuations, but with no overall decline in real (rice) wage rates of agricultural labour. Indeed the level has fluctuated between 3.3 and 5.1 kg coarse rice per day during the 1990s, which is significantly above the levels of the 1970 and 1980s. (see also Palmer-Jones, 1999). This lends support to the idea that agricultural growth, especially food grain sector, must have been associated with genuine increase in rural employment – since real wages have not fallen – and has largely had a positive impact on poverty reductions.

In terms of food consumption and nutrition indicators, there also seem to be perceptible improvement. For example, between 1991-92 and 2000 HES, per capita intake of two major cereals- rice and wheat dropped (rice by 3 percent and wheat substantially), potato consumption increased by 25 percent. Also, per capita consumption of other protein foods increased. Fish consumption increased by 9 percent, meat by 48 percent, poultry by 120 percent and milk by 55 percent, but

the intake of pulses declined by 13 percent (World Bank, 2002). More or less similar estimates are also reported by the BBS, 2001).

What is more intriguing is that while there has been some rural poverty reduction, there are regions such as Mymensingh, Rangpur, Faridpur and Barisal, which still experience higher rural poverty incidence than the national average (Ahmed, 2000). Also, there are considerable regional differences in real wages levels (see Wodon, 1996, for some analysis). These spatial differences suggest need to look more closely at regional agricultural growth patterns and their links to poverty reduction.

Also, when the average calorie intake figures of 2283 kcal from the Poverty Monitoring Survey of 1999 are desegregated, one finds that the rural poor consume only 1932 kcal per capita per day, which is 378 kcal short of the minimum requirement. On the contrary, the rural non-poor absorb an average of 2555 kcal, meaning 245 kcal in excess of requirement (see Mandal, 2000).

6. WAY FORWARD

Although Bangladesh has attained self-sufficiency in food grain production and succeeded in ensuring a stable food supply for its expanding population, even in the face of severe natural disasters, there are important concerns about how to sustain this momentum and expand the base of agricultural production. Such concerns are raised very strongly especially when there are year to year and seasonal fluctuation of production, and more extensive diversification of the rural economy is yet to take place. The country's natural resource base, especially land and water, is narrowing, soil quality is depleting and above all pressure of global integration and competition for improving efficiency of domestic agriculture is mounting.

In order to meet these challenges, Bangladesh has to pursue strategies that promote rapid transformation of the economy from one which is predominantly rice-based crop agriculture, to one which is sufficiently diversified with faster growth of non-agricultural sectors. Since the rural sector is and will remain as the dominant sector of food production, employment creation and income generation, formulation of appropriate strategies for promoting agriculture and rural economy growth is crucially important. Some of the key approaches are suggested here.

Agriculture's natural resource base of land and water has to be managed and utilized to harness their best potentials. In the backdrop of declining farm size and increasing fragmentation, increased public sector supports to technology

development, input supplies, credit and extension services are needed. But more innovative approaches involving the private sector are also needed to sustain agricultural growth in the declining farm size situation. One possible case in hand is to facilitate a new form of production organization, i.e. contract farming, by a number of private sector agri-business firms for production and marketing of high value non-rice crops as well as broilers and milk. This type of commercial farming seems promising in Bangladesh since these will be eventually vertically integrated with the export market.

The growth in agriculture generates increasing backward and forward linkages from supply side through increased use of modern inputs and also from demand side through rising income led consumption of foods, manufactured goods and services. A modest increase in agricultural growth has potential to generate substantial improvement in labour productivity; furthermore, a stimulus to agricultural growth also comes from increases in income from non-farm activities, mainly trading and services. So, a proper strategy for responding to the changing pattern of demand against a background of improved food security will be to open up opportunities for cheap rural labour to promote high value non-cereal crops and enterprises such as vegetables, fruits, poultry, milk, meat and fish culture.

As a practical strategy, the high value crops and food products should first be given a domestic focus, which will not require as high level of sophistication in varietal selection, production practices or marketing of products as for export markets. Once the domestic market gains experience from 'learning by doing' in transaction and handling of larger volumes of these products, the country then can gradually venture into distant and export market. The important lessons of Asian countries like Taiwan and Korea, can be very useful.

Bangladesh has a number of agro-ecologically constrained areas which include deeply flooded areas (16%), char land (4%), flush flood areas (11%), coastal tidal surge and salinity prone areas (1%) and hill agriculture regions (9%). These areas have poor communication and transport system, difficult soils, scanty agricultural extension network, slow adoption of modern technologies, low production base, poor marketing facilities, high incidence of poverty, and so on. Future development attention need to be directed to these areas, which will not only enlarge the country's agricultural production base but also will have lifted many of the inhabitants of the areas out of poverty.

Appropriate financial, technical and fiscal supports need to be given to the private sector for development of agro-processing industries for improving value addition to products. Evidence from East Asia suggests that developing local agro-

industry, and high value horticultural and livestock industries can be a stepping stone to raising quality and gaining ultimately access to international markets.

National research system should be given more allocation not only for revenue budget but more importantly for regular development budget directed to strengthening of research capacities, communication to international research centres and linking with information network. Biotechnology research and development of hybrid crops (also, genetically modified crops and animal species) need to be considered seriously in order not to miss whatever opportunities exist.

For sustaining growth of diversified agriculture and increasing rural incomes as discussed above, rural non-farm economy needs to be mainstreamed in the policy debates and documents. The provisions for training on product design, quality improvement, marketing outlets, business development services, etc are the

Table 1 : Overtime changes in number and structure of farm holdings in Bangladesh

Parameters	1983/84	1996	Change (%)
1. Total holdings ('000)	13818	17828	+29.0
2. Total non-farm holdings ('000)	3772	6030	+59.8
	(27)	(34)	
3. Farm holdings ('000)	10045	11798	+17.5
	(73)	(66)	
4. Small Farm ('000)	7066	9423	+33.3
	(70)	(80)	
5. Medium Farm ('000)	2483	2078	-16.3
	(25)	(18)	
6. Large Farm ('000)	496	297	-40.1
	(5)	(2)	
7. Absolute landless ('000)	1198	1815	+51.5
	(9)	(10)	
8. Ag. labour households ('000)	5495	6401	+16.5
	(40)	(36)	
9. Area Cultivated ('000ha)	8158	7192	-11.8
10. Average farm size (ha)	0.81	0.61	-24.7
11. Homestead area per hh (acre)	0.08	0.09	+1.0
12. Per capita cultivated area (ha)	0.10	0.06	-40.0

Source: BBS (1999): Census of Agriculture, 1996, Vol 1

Figures in the parentheses indicate percentages

prerequisites. Appropriate financial institutions and credit services need to be expanded in the rural areas for RNF development. Besides, new drivers of RNF sector growth such as IT services should be promoted.

For promoting growth in agriculture and the rural economy as a whole, all possible rural-urban linkages need strengthening. These will not only link the big urban enterprises with numerous small home-based activities in the rural areas, but also expand the opportunities that rural and small towns may play to foster poverty reduction.

Table 2 : Average Annual Growth Rates of Agricultural GDP by Sub-Sectors

Sector/ Sub- sector	1991/92-1995/96	1996/97-2000/01	1991/92-2000/01
1. Agriculture	0.43	4.30	2.36
a. Crops & vegetables	-0.25	4.50	2.17
b. Livestock	2.42	2.69	2.56
c. Forestry	2.87	4.74	3.81
2. Fishery	7.76	8.76	8.26
3. Overall GDP	4.64	5.49	5.06

Note: Agriculture includes horticulture

Source: Planning Commission, 2001.

Table 3 : Rice Wages of Agricultural Labourers

Year	Agricultural wage ¹ (TK/day)	Coarse Rice Price (Tk/Kg)	Rice wage ² (Kg/day)
1990-91	42.2	10.10	4.18
1991-92	41.5	10.72	3.87
1992-93	40.5	9.19	4.40
1993-94	39.5	9.60	4.12
1994-95	40.8	12.27	3.32
1995-96	46.3	13.04	3.55
1996-97	50.0	10.94	4.57
1997-98	52.1	12.21	4.26
1998-99	57.9	14.72	3.93
1999-00	62.0	12.17	5.11

Source: 1990-91 to 1994-95 figures are from Palmer-Jones (1999); 1995-96 to 1999-00 figures are author's own calculation based on Monthly Statistical Bulletin of BBS, various issues.

1. Indicates daily wage without food.
2. Indicates amount of coarse rice that a daily wage can buy (i.e. daily wage/coarse rice price).

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