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Rural Non-Farm Economy in Bangladesh: A View from Household Surveys

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Mahabub Hossain

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Centre for Policy Dialogue
House No 40/C, Road No 11 (new), Dhanmondi R/A, Dhaka-1209
Mailing Address: GPO Box 2129, Dhaka 1000, Bangladesh
Tel: (880 2) 8124770, 9141703. 9141734; Fax: (880 2) 8130951
E-mail: cpd@bdonline.com; Website: www.cpd-bangladesh.org

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The present paper, **Rural Non-Farm Economy in Bangladesh: A View from House Hold Survey,** has been prepared as part of CPD's on-going agricultural policy research and advocacy activities with the International Rice research Institute (IRRI) under the Poverty Elimination Through Rice Research Assistance (PETRRA) project.

The present paper titled ***Rural Non-Farm Economy in Bangladesh: A View from House Hold Survey*** has been prepared by *Dr Mahabub Hossain*, Head, Social Sciences Division, International Rice Research Institute (IRRI), Manila, Philippines. The paper was presented at the CPD organised dialogue on ***Promoting Rural Non–Farm Economy: Is Bangladesh Doing Enough?*** held on September 08, 2003 at BRAC Centre INN Auditorium, Dhaka.

Assistant Editor: *Anisatul Fatema Yousuf*, Head (Dialogue & Communication), CPD
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RURAL NON-FARM ECONOMY IN BANGLADESH: A VIEW FROM HOUSEHOLD SURVEYS[1]

Mahabub Hossain[2]

I. Introduction

The role of non-farm activities in promoting growth of rural economy and reducing poverty is well documented (Hymer and Resnic, 1969; Child and Kaneda, 1975; Chuta and Liedholm, 1979; Binswanger, 1983; Islam, 1984; Shand, 1986; Saith, 1992; Ranis and Stewart, 1993; Reardon, 1997; Weijland, 1999; Reardon, Ellis, 2000; Hayami and Kikuchi, 2000; Rosegrant and Hazell, 2000; Berdegue and Escobar, 2001; Gordon and Craig, 2001; Lanjouw and Lanjouw, 2001; Haggblade, Hazell and Reardon, 2002). Crowned as rural non-farm economy (RFNE), the sector accounts for a large proportion of rural employment and incomes, and grows faster than agriculture with the development of the overall economy. As Rosegrant and Hazell (2000) observes, "From relatively a minor sector, often largely part-time and subsistence-oriented at the early stages of development, the rural non-farm economy develops to become a major motor of economic growth in its own right, not only for the countryside but for the economy as a whole. Its growth also has important implications for the welfare of women and poor households, sometimes helping to offset inequities that can arise within the agricultural sector."

Generating productive employment for the growing labor force remains a formidable challenge for the Bangladesh economy. Recent success in fertility reduction is contributing to an increase in the proportion of the working age population, majority of them still remain in rural areas in spite of the rapid rural-urban migration of population. The capacity of absorbing the incremental rural labor force in agriculture is extremely limited because of a) no scope of expansion of the land frontier, b) the intensity of cropping has almost reached the limit, c) the growth of crop production now depends

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almost entirely on technological progress resulting in low employment elasticity of output, and d) the need for increasing labor productivity and reducing unit cost through mechanization. Recent censuses and labor force surveys show a dramatic structural change in the composition of rural labor force in favor of non-farm activities. Doubts however continue to persist about the employment generation and growth potentials of RFNE , due to lack of information on the types of activities, the nature of their operation and the constraints and opportunities. For Bangladesh a fairly comprehensive knowledge on the supply and demand factors operating in rural industries is available (BIDS 1981; Hossain 1987; Ahmed 1984). But rural industries is found to be a small component of the rural non-farm activities (Islam and Muqtada 1986; Hossain *et al*. 1994). Information on the operation of other rural enterprises is however inadequate for policy analysis (Bakht 1996).

The purpose of this paper is to provide additional evidence on RNFE, available from a repeat survey of a nationally representative sample of rural households conducted for assessing recent changes in rural livelihood systems. The benchmark survey was implemented in 1987-1988 by the Bangladesh Institute of Development Studies (BIDS) on 1245 rural households from 62 villages in 57 districts, drawn by using a multistage random sampling method. In the first stage 64 unions were randomly selected from the list of all unions in the country. In the second stage one village was selected from each of the unions that best represented the union with regard to the size of land holding and the literacy rate. A census of all households in the selected villages was conducted to stratify the households with regard to the size of landownership and land tenure. A random sample of 20 households was drawn from each village such that each stratum is represented by its probability proportion. The survey could not be implemented in two villages that belonged to the Chittagong Hill Tracts region. The International Rice Research Institute (IRRI) studied the same villages in 2000-01. A sample of 1880 households was drawn using the stratified random sampling method. The stratification was based on wealth ranking technique of the participatory rural appraisal (PRA) method. The 2000-01 sample included households and their descendents covered in the 1987-88 survey. The author supervised implementation of both surveys. The paper also draws on household level data of the 2000 Household Income and Expenditure survey conducted by the Bangladesh Bureau of Statistics (BBS).

The paper is organized as follows. Section II presents findings of the surveys on a) the importance of the RNFE activities as a source of rural employment and b) factors affecting participation in it. Section III estimates the duration of employment and the level of productivity, to examine whether the expansion of the RFNE is caused by "push" or "pull" factors. The contribution RFNE to rural household income and its distribution is assessed in Section IV. Section V gives an in-depth view of rural business enterprises, its link with agriculture, and assesses whether access to capital is a constraint to expansion of RFNE. Section V1 analyzes the expenditure pattern of rural and urban households to assess the demand for non-farm goods and services. Section VII provides an overview of strategies and policies for the development of the rural non-farm sector.

II. Generation of employment

The paper takes a narrow definition of the RNFE that includes only non-agricultural activities. We exclude non-crop production activities such as livestock, fisheries and forestry. Some of the commercial livestock and fisheries activities are however vertically integrated encompassing production, processing and marketing activities. Therefore they deserve to be included in the broader definition of RFNE.

We distinguish three types of non-farm activities:

a) Manual labor-based activities, such as self-employment in cottage industries, mechanics, wage employment in rural business enterprises, transport operations, and construction labor,
b) Human capital based occupations, such as salaried service in public and private sector institutions, teachers, religious leaders, lawyers, village doctors, and various types of personal services (barbers, laundry services, mid-wives etc), and
c) Physical and human capital intensive activities, such as agro-processing, shop-keeping, peddling, petty trading, medium and large scale trading, and contractor services.

Table 1 presents information on the primary and secondary occupations of rural workers. In 2000, 52 percent of the earning members of the households reported RNF activities as their primary occupation and another 10 percent as secondary occupations. The corresponding numbers obtained from the 1987 survey was 34 and 15 percent respectively. In 2000, 30 percent of the workers reported a secondary occupation, substantially lower than the level (41 percent) reported in 1987. The numbers show that

majority of the rural workers are now dependent on RNFE as primary source of employment, more workers are now taking them up as fulltime occupations, and the employment in the sector has been growing at a fast rate.

Table 1. Distribution of rural workers by type of employment, 1987 and 2000

Category of employment	Primary occupation		Primary or secondary occupation	
	1987	2000	1987	2000
Agriculture:	66.1	47.6	91.8	66.7
Cultivation of own farm	43.2	35.4	60.4	45.6
Agricultural wage labor	21.7	11.3	28.2	18.4
Livestock and fisheries	1.2	0.9	3.2	2.7
Non-agriculture:	33.9	52.4	48.7	62.9
Services	15.5	22.1	17.9	23.7
Business	7.6	11.9	12.7	16.0
Shop keeping	1.5	2.0	2.4	2.3
Mechanic	0.7	3.5	0.9	3.9
Rickshaw/van pulling	2.0	4.8	2.4	5.8
Other transport	1.3	1.2	1.4	1.4
Construction labor	3.4	3.7	7.1	4.8
Other non-agricultural labor	1.9	3.2	3.9	5.0
Total	100.0	100.0	140.5	129.6

Source: BIDS-IRRI sample household surveys

Surveys of available information from other developing countries show that the non-farm sector provides 20 to 45 percent of full-time employment (Chuta and Liedholm, 1979: Rosegrant and Hazell, 2000). The contribution of RFNE in the generation of rural employment in Bangladesh is thus on the high side.

In 2000, a third of the rural employment was generated in business enterprises and service sector activities. The proportion of workers engaged in these activities increased by nearly 60 percent over the 1987-2000 period. The service sector activities are relatively full-time activities, while a substantial proportion of workers take up business activities as a part-time occupation. A large proportion of the employment in services was however generated in rural towns and cities rather than in the villages themselves. About six percent of the rural households reported one or more family members employed in "foreign service" and sent remittances on a regular basis.

The largest expansion of employment has taken place in rickshaw/van pulling and self-employed repair and maintenance services such as mechanics. Rural workers employed in

these two occupations were 2.7 percent of all rural workers in 1987; the number grew to 8.3 percent by 2000. The findings show positive impact of the expansion of rural roads, and vast increase in the number of shallow tube wells, power pumps and power tillers on employment generation in the repair and maintenance activities.

The changes in the composition of rural employment show increasing occupational mobility from farm to non-farm activities (**Table 1**). The proportion of cultivators declined from 43 to 35 percent over 1987-2000, and the proportion of agricultural wage laborers became almost half. The importance of agricultural wage labor as a part-time occupation has increased over time.

The occupational mobility from farm to non-farm activities is partly facilitated by the improvement in the quality of human capital. The surveys estimate that the primary school participation rate increased from 59 to 89 percent for the children in the relevant age group (6-11) over 1987-2000. The secondary school participation rate increased from 51 to 66 percent. The proportion of adult workers with no formal schooling declined from 63 to 40 percent, and the average year of schooling increased from 3.1 to 4.3 years. Those who had no formal schooling continued to be employed in farming (if the household owns land) or in agricultural wage labor (workers from the landless and marginal landowning households). However many who attended secondary schools or have high school certificates reduce left cultivation to join services or business enterprises (**Table 2**).

Table 2. Major occupational pattern for workers with different levels of education

Education level & period of information	Occupational pattern (per cent of worker in braces)		
	First	Second	Third
No formal schooling:			
1987	Cultivation (37)	Agri-labour (34)	Trading (7)
2000	Cultivation (38)	Agri-labour (25)	Rickshaw (9)
Primary school:			
1987	Cultivation (48)	Agri-labour (19)	Services (8)
2000	Cultivation (39)	Trading (13)	Agri-labour (10)
Secondary school:			
1987	Cultivation (52)	Services (17)	Trading (11)
2000	Cultivation (35)	Services (23)	Trading (16)
School certificate & above:			
1987	Services (48)	Cultivation (33)	Trading (9)
2000	Services (56)	Cultivation (20)	Trading (14)

Source: BIDS-IRRI sample household surveys

An important issue in the context of poverty reduction is whether the landless and marginal landowners find employment in non-farm activities. In 1987, 43 percent of the workers from the functionally landless households (those who own up to 0.2 ha) were engaged in agricultural wage labor **(Table 3).** Only 12 percent reported farming as their principal occupation. As the workers from the land owning households are moving out from farming with higher education, they are renting out the land to the illiterate land-poor households. The proportion of area under tenancy cultivation has increased from 23 percent in 1987 to 34 percent in 2000, and the proportion of tenant and part-tenant farmers from 44 to 54 percent. With greater availability of land in the tenancy market, farming has become more important source of livelihood for the functionally landless households.

The landless are moving out from the agricultural labor market in favor of non-farm jobs (**Table 3**). About 42 percent of workers belonging to households owning up to 0.2 ha of land were engaged in rural non-farm activities in 1987; the number has increased to 58 percent in 2000. The occupational mobility for the workers from the medium and large land owing households was from cultivation of own farms to services and business. Workers from the landless households, on the other hand, moved out from agricultural wage labor to tenancy cultivation and manual labor-based non-agricultural activities such as rickshaw pulling, mechanics, and wage laborer in trade and business enterprises. The lack of education and access to finance may be the major constraint for the land-poor

households to avail of the employment opportunities in business enterprises and service which are relatively higher remunerative activities (see later)..

Table 3. Changes in the importance of different occupations for land poor and land rich households

Primary occupation	Land poor (own up to 0.2 ha)		Land rich (own 1.0 ha & above)	
	1987	2000	1987	2000
Agriculture:	58.0	42.2	74.0	52.4
Cultivation of own farm	12.5	18.1	67.6	51.2
Agricultural wage labor	44.1	22.3	5.9	1.2
Livestock and fisheries	1.4	1.8	0.5	0.0
Non-agriculture:	42.0	57.8	26.0	47.6
Services	14.8	15.1	13.7	25.7
Business	10.9	13.1	3.8	11.5
Shop keeping	1.8	2.6	1.4	2.2
Mechanic	0.8	4.8	0.5	2.7
Rickshaw/van pulling	4.2	9.7	0.9	0.8
Other transport	1.9	1.5	1.4	1.1
Construction labor	5.0	5.9	3.1	1.9
Other non-agricultural labor	2.6	5.1	1.2	1.7
Total	100.0	100.0	100.0	100.0

Source: BIDS-IRRI sample household surveys

We applied a TOBIT model to analyze factors influencing participation of rural households in RFNE. Participation could be measured as a dichotomous variable with value “1” for households having members engaged in RFNE, and “0” otherwise. However a closer scrutiny of the income data revealed that RFNE generated some income even for households who did not report RFNE as primary and secondary occupation. This indicates that households try to eke out a living from multiple occupations and that some non-farm activities which are undertakes as a third or fourth source of income are not captured by employment data. So we decided to use the proportion of household income derived from RFNE as a measure of the intensity of participation, and used it as the dependent variable, rather than using the employment data.

The justification for including the explanatory variables (see **Table 4**) in the model is as follows. If participation were poverty-induced, one would expect participation to be higher in households with smaller size of landownership and fewer earning members, and larger number of consumers relative to earning members (dependency ratio). The age of

the household head may also affect participation because the dependency ratio may be higher in older households, and the resultant subsistence pressure may increase the need to augment incomes from non-farm activities (Chayanov, 1966). Having access to land from the tenancy market may reduce such pressure. The level of education of a worker may facilitate participation in RFNE by providing the necessary skills. The spread of modern agricultural technology will increase the productivity of land and labor, and hence may reduce the subsistence pressure and the need to participate in the non-farm sector. The state of development of infrastructure will reduce the cost of operation of directly productive activities and facilitate marketing of inputs and products, and hence may encourage private investment in rural non-farm activities. The development of transport, communication and rural electrification will increase the opportunity cost of leisure by providing access to modern amenities of life, and hence may activate the "pull" factors for the expansion of rural non-farm activities.

Since the value of the dependent variable is truncated at both ends, i.e., with value varies from zero to 100, we used the TOBIT model for estimating the model. The model has been estimated separately for the three groups of RNF activities- non-agricultural labor, services and business, as well as for all non-farm actives. The estimates of the parameters of the model are presented in **Table 4.**

The factors influencing participation is found to vary across groups of activities. Participation in manual labor-based activities (transport, construction and cottage industry and wage labor) seems to be poverty driven. The intensity of participation in these activities is negatively associated with the size of ownership of land and non-land fixed assets, and the level of education of the workers. The negative coefficient of the technology variable shows that the adoption of high yielding rice varieties reduces the pressure of participation in the non-agricultural labor market. However, the larger the number of workers in the households the higher is the level of participation in these activities. The participation is higher in younger households, which is contrary to the Chayanovian hypothesis. The negative association with age indicates the preference of younger generation for non-farm jobs compared to the arduous agricultural wage labor. The coefficient of the dependency ratio shows positive association of participation with subsistence pressure, but the coefficient is not statistically significant.

Table 4. Factors affecting participation in rural non-farm activities: Estimates of a TOBIT Model

Factors	Bbusiness	Services	Non-agricultural labor	All non-farm activities
Size of land owned (ha)	-2.668 (-1.44)	-10.697* (-4.39)	-50.464* (-7.19)	-13.521* (-10.49)
Area under tenancy (percent of holding)	-0.095 (-1.86)	-0.226* (-3.80)	0.050 (0.73)	-0.147* (-4.51)
Age of the household head (years)	-0.516* (-3.59)	0.504* (3.38)	-0.966* (-4.81)	-0.166 (-1.88)
Household workers (number)	9.935* (5.07)	-3.002 (-1.39)	23.642* (7.49)	9.599* (7.43)
Dependency ratio (consumer/worker)	4.328* (3.67)	-3.659* (-2.82)	1.833 (1.09)	1.139 (1.51)
Average education of worker (years of schooling)	0.678 (1.57)	5.011* (10.63)	-3.925* (-5.86)	2.263* (8.20)
Value of non-land fixed assets (thousand Taka)	0.071* (7.31)	0.009 (0.86)	-0.833* (-5.24)	0.040* (5.54)
Coverage of modern rice varieties (percent of cultivated area)	0.033 (1.29)	-0.102* (-3.48)	-0.173* (-4.28)	-0.145* (-8.55)
Status of infrastructure development (Villages with developed infrastructure =1)	11.966* (3.47)	3.159 (0.83)	7.670 (1.63)	10.201* (4.61)
Constant term	-44.417* (-4.90)	-50.154* (-5.02)	-10.345 (-0.85)	29.178* (5.19)
Sigma	61.288* (30.57)	63.887* (27.85)	72.213* (25.91)	46.169* (49.99)
Log likelihood function	-4158	-3548	-3000	-7858

Note: The dependent variable is measured as the share (percent) of the non-farm activity to total household income. Figures within parentheses are asymptotic 't" values.

Source: Estimated from household level data from the BIDS-IRRI surveys

The most important factor affecting participation in the service sector activities is obviously the level of education of the workers. Larger size of landownership, access to land in the tenancy market and the intensity of adoption of high-yielding rice varieties seem to reduce pressure for participation in services (presumably for those at the lower

end of the productivity scale), as indicated by the statistically significant negative coefficients for these variables. Participation is higher for workers belonging to older households. The negative coefficients of the variable representing number of workers and subsistence pressure presumably indicate smaller family size in households engaged in service sector activities (the positive effect of education on reduction of fertility).

The major determinants of participation in business activities are accumulation of non-land assets, larger number of workers in the household and access to developed infrastructure. Participation is higher in younger households. It is interesting to note that the intensity of adoption of high-yielding rice varieties and the level of education of the worker do not exert significant influence on participation in trade and business activities. Even the low-educated involve themselves in business provided they have access to capital.

III. Duration of employment and productivity of labor

Do non-farm activities provide relatively full time employment? Are they taken up basically to augment household incomes during slack seasons of agricultural activities? Both farmers and agricultural labor households may embrace multiple occupations to shield against seasonal fluctuations in employment and incomes. Reardon (1997) observed that in Africa non-farm income was a means for the poor to stabilize income during drought years. Walker and Ryan (1990) observed that in the semi-arid tropics in India non-agricultural self-employment not only became an increasingly important source of income but also was a means of dampening household income variability. An estimate of the duration of employment during a year can shed some light on this issue.

The BIDS-IFPRI survey collected data on the number of workers employed in specific off-farm and non-farm activities, the number of months employed in the activity, the number of days employed in a month, and the average number of hours employed in each day. We estimated standard eight-hour person-days of employment for each worker from the data. The information is presented in Table 5. The findings show that business, services, shop keeping and transport operations are relatively full-time occupations, while construction work and non-agricultural wage labor are relatively part-time occupations. Thus, the hypothesis that non-farm activities are undertaken for seasonal smoothening of employment and income is valid only for a small fraction of non-farm activities. The comparison of the number of 1987 and 2000 indicate that the duration of employment has

increased over-time, particularly for trade and business, shop keeping and transport operations.

The level of labor productivity is a good indicator of the strength of RFNE. If labor productivity were lower than the agricultural wage rate, it would support the hypothesis of the operation of "push" factors behind the expansion of RFNE. Higher labor productivity, on the other hand, is an evidence of the existence of the "pull" factors (Hymer and Resnick, 1969; Islam R. 1984; Shand, 1986; Hossain et al., 1994).

The Rural Industries Study Project conducted by BIDS during the late 1970s noted a large number of rural industries that used traditional technology and employed mainly women from low-income households (BIDS 1981). The examples of such industries are rice processing by *dhenki (wooden husker),* cloth and *gamchha* making by pit looms, village pottery, mat and net making etc. The productivity of labor in these industries was very low (Hossain, 1984); in most cases lower than the agricultural wage rate. Most of these low-productive industries have already disappeared under competition with improved technologies such as rice mill, semi-automatic and power looms; as higher remunerative alternative employment opportunities become available with large scale expansion of micro-credit provided by NGOs to low-income households (Hossain 1988a).

The estimates of labor productivity obtained from the BIDS-IRRI resurvey shows that productivity is 10 to 40 per cent higher than the agricultural wage rate for non-farm activities that needs very little physical and human capital, such as construction work, *rikshaw* pulling. In services and business enterprises, average labor productivity was two to 3.5 times higher than the agricultural wage rate (**Table 5**). The labor productivity in business and service sector activities was however substantially lower for workers belonging to the functionally landless households than for those who belong to the medium and large landowning households (**Table 6**). The findings indicate that the resource-poor households are engaged in business and service sector activities at the lower end of the productivity scale, presumably due to lack of access to capital and education.

Table 5. Duration of employment and labor productivity, 1987 and 2000

Activity	Duration of employment			Labor productivity		
	1987	2000	Change %	1987	2000	Change %
Agricultural labor	200	175	-13	0.90	1.01	12
Cottage industry	211	209	-1	1.17	1.08	-8
Rickshaw transport	218	259	19	1.44	1.39	-3
House construction	110	142	29	1.54	1.68	9
Road construction	84	72	-14	0.96	1.19	24
Shop keeping	299	351	17	1.22	1.55	27
Business	216	244	13	2.25	3.46	54
Services	310	299	-4	1.69	2.30	36
All activities	217	224	3	1.43	2.28	59

Source: BIDS-IRRI sample household surveys

Table 6. Labor productivity for different landholding groups in 1987 and 2000

Activities	Functionally landless (with up to 0.2 ha)		Small land owner (0.2 to 1.0 ha)		Medium and Large land owner (over 1.0 ha)	
	1987	2000	1987	2000	1987	2000
Agricultural labor	0.90	1.01	0.88	1.01	---	---
Cottage industry	1.10	1.12	1.38	1.06	---	---
Rickshaw transport	1.42	1.38	1.57	1.42	---	---
House construction & repair	1.57	1.43	1.38	2.53	---	---
Road construction & repair	0.90	1.19	1.12	---	---	---
Shop keeping	1.04	1.73	1.20	1.33	1.57	1.46
Business	1.82	2.82	1.81	3.08	4.25	5.66
Services	1.45	1.54	1.66	2.53	1.97	2.93
All activities	1.22	1.63	1.38	2.51	2.64	4.28

Source: BIDS-IRRI sample household surveys
Note: '----' means the value is not estimated because very few samples

Since the productivity of labor in non-farm occupations is higher than the agricultural wage rate, even for the land-poor households, the mobility of rural workers from agriculture to the non-farm sector is contributing to an increase in the productivity and earnings of rural workers. The evidence thus supports the proposition of the existence of "pull" factors that the higher productivity and wage earnings in most non-farm activities are luring labor from relatively low-productive, risky, and back-breaking farm activities. The average productivity in off-farm and non-farm occupations has increased from US$1.43 per day in 1987 to $2.28 in 2000-2001: an increase of 3.6 percent per year. The productivity growth was lower for the functionally landless groups (2.2% per year) and the highest for the middle land owning group (4.6%)..

The pull factor may be due the growth in agricultural productivity itself, which stimulates employment generation in the rural non-farm sector through linkage effects (Mellor, 1976, Haggblade and Hazell, 1989). Drawing on data from selected Asian countries, Rosegrant and Hazell (2001) observed a positive relationship between the level of agricultural income and the proportion of rural employment and income derived from non-farm activities. For each dollar increase in agricultural value added, an additional $0.5 to $1.0 income is generated in the non-farm sector.

IV. Contribution to rural income and its distribution

Rural households do not keep records of their transactions and hence reliable estimation of income is problematic, especially by asking direct questions to the respondent. Rural people sometimes consider savings as income, and often self-consumption of the household produce is not considered as income.

The concept of income used here is comprehensive, including income received in kind and in cash. A money value was imputed to production and receipts in kind at average prices for the entire sample for the reference year of the survey. Household consumption of self-produced crops, livestock, forestry and fishery products is included in income. The income from crop production activities is estimated as the value of the main product and the by-products net of the costs on account of seeds, fertilizers, pesticides, irrigation charge, payment to hired labor, and rental charge of animal labor and agricultural machinery. For business enterprises, the income is estimated as gross returns minus business-related expenses. The estimates are crude because the survey did not collect detail information on business transactions; rather the data reflects the respondent's memory. Due to lack of information no allowance could be made for the depreciation of fixed-assets and owner-occupied housing that is sometimes used for business purposes.

For international comparison, as well as for comparison over time, we expressed the nominal income in US dollars at the exchange rate for the reference year of the survey. The exchange rate used was TK 30.95 per US dollar for 1987 and 52.14 for 2000. It may be argued that the growth rate estimated from the dollar values may not reflect real growth, because the purchasing capacity of the dollar has also changed over the 1987-2000 period. Selecting an appropriate deflator for estimating the growth rate in real income is in any case problematic. The exchange rate increased by 68 percent over the period compared to 72 percent increase in the wholesale price index, and 43 percent

increase in the price of paddy (un-husked rice), the principal agricultural product. Since the change in the exchange rate and the wholesale price index is similar, the growth rate estimated from the dollar denominated income should approximate the growth in real income. The change in paddy prices however indicates that rice farmers suffered severe erosion in the terms of trade over this period.

The estimates of the BIDS-IRRI surveys on the level, composition and the growth of rural household incomes are presented in **Table 7**. For 2000, the average household income is estimated at US$1232, an annual increase of 2.2 percent over the level (US$ 931) estimated for 1987. The average number of members in the household has declined from 6.06 in 1987 to 5.55 in 2000. Thus, the per-capita rural income increased from US$154 for 1987 to US$222 for 2000, indicating a growth of 2.8 percent per annum. The 2000 Household Income and Expenditure Survey conducted by the Bangladesh Bureau of Statistics estimated the per capita income for rural areas at US$212, which is 4.5% lower than our estimate.

Table 7. Structure and growth of rural income, 1987 and 2000

Source of income	Annual income (current US$)		Share of income (percent)		Growth of income (%/year)
	1987	2000	1987	2000	
Agriculture:	543	565	58	46	0.3
Rice farming	264	250	28	20	-0.4
Non-rice agriculture	176	265	19	22	3.2
Agricultural wage labor	102	50	11	4	-5.2
Non-agriculture:	388	667	42	54	4.2
Business	123	287	13	23	6.7
Services	194	299	21	24	3.4
Non-agricultural labor	71	81	8	7	1.1
Total	931	1,232	100	100	2.2

Source: BIDS-IRRI sample household surveys

The growth in rural incomes over 1987-2000 was almost entirely on account of the non-agricultural sectors. The fastest growing economic activities were business and services, followed by non-rice agricultural activities. The income from rice production and agricultural wage-labor declined in absolute terms. The income from manual labor-based non-agricultural activities, increased at only 1.1 percent per year. **The share of non-agriculture in total household income has grown from 42 percent in 1987 to 54 percent in 2000.** From a sample survey of 16 villages Hossain (1988) estimated the

share at 36 percent for 1982. Thus, the income from rural not farm activities has been increasing at a faster than that from agriculture since the early 1980s.

What has happened to the distribution of rural income? Has non-farm sector moderated the concentration of income from land that is highly unequally distributed in Bangladesh? The sample households were ranked in the scale of per capita income and income shares of successive deciles groups were estimated to study the pattern of distribution of income in the samples. The results are reported in **Table 8**. The income distribution is fairly unequal and has worsened over time. The income share of the bottom 40% of the households has declined from 17 to 14 percent over 1987-2000, while the income share of the top 10 percent has increased from 32 to 35 percent. The Gini ratio for the concentration of household income increased from 0.40 to 0.45.

Table 8. The pattern of distribution of income from non-farm sources, 1987 and 2000

Rank in per capita income scale	Share of household income (%)		Share of non-farm income (%)		Non-farm income as % of household income	
	1987	2000	1987	2000	1987	2000
Bottom 40%	17.1	14.1	12.5	10.7	30.6	40.8
Middle 40%	37.1	34.8	32.3	34.1	36.3	53.2
Ninth decile	14.0	16.2	13.0	16.6	38.7	55.3
Top 10%	31.8	35.0	42.2	38.5	55.5	59.6
Total	100.0	100.0	100.0	100.0	41.6	54.2

Source: BIDS-IRRI sample household surveys

The rural nonagricultural income is however more unequally distributed than the income from agriculture. In 2000, bottom 40 percent of the households in the per-capita income scale received 11 percent of the income from non-agricultural sources, while the top 10 percent of the households received 39 percent. Compared to 1987, the ninth deciles group and the middle 40% have increased their share of the non-agricultural income, while the share for the bottom 40% as well as the top 10% has declined marginally. The Gini coefficient for the concentration of income remained unchanged at 0.51.

In order to have more insights into the contribution of different sources of income to the deterioration in the inequality in rural household incomes over the period, we conducted a Gini decomposition analysis using the method suggested by Pyat et al., (1980) and Shorrocks (1983). The distribution of total income would change because of changes in

the distribution of different components of income and/or changes in the income share of different components. If additional income were derived from a relatively equally distributed source, income distribution would improve. Conversely, if the faster growing sources of income are more unequally distributed, the overall income distribution will worsen.

The economic standing of a household depends on per capita income; not on the income from an individual component. Thus the Gini rato of income for individual component does not have any economic meaning. So we have measured the concentration ratio of income for individual components by maintaining the same rank of households in the scale of per capita incomes. These pseudo-Gini coefficient for the component when multiplied by the income share of the component gives the absolute contribution of the component to the Gini coefficient for total household income. The estimates are reported in **Table 9**.

Table 9. Concentration of household income and its decomposition, 1987 and 2000

Source of income	Share of income from the source		Concentration of income from the source (*Pseudo* Gini ratio)		Absolute contribution to income inequality	
	1987	**2000**	**1987**	**2000**	**1987**	**2000**
Agriculture:	58.3	45.8	0.320	0.386	0.186	0.177
Rice farming	28.4	20.3	0.456	0.435	0.129	0.088
Non-rice agriculture	18.9	21.5	0.308	**0.471**	**0.058**	**0.101**
Agricultural wage labor	11.0	4.1	-0.013	-0.308	-0.001	-0.013
Non-agriculture:	41.7	54.2	0.508	0.511	0.212	0.277
Business	13.2	23.3	0.489	**0.606**	**0.065**	**0.141**
Services	20.9	24.3	0.630	**0.551**	0.131	0.134
Non-agricultural labor	7.6	6.5	0.209	0.025	0.016	0.002
Household income	100.0	100.0	0.398	0.454	0.398	0.454

Note: The negative value of the pseudo Gini coefficient means that the income from this source is distributed in favor of the low-income groups.

Source: Estimated from BIDS-IRRI sample household surveys.

The findings indicate that business is the most unequally distributed source of income, followed by services and non-rice agriculture. These are also the sources for which the income share has increased over time. The pseudo-Gini coefficient has increased for business and non-rice agricultural activities, indicating that higher income groups have benefited more from additional income generated in these activities. The concentration of income for services and non-agricultural labor has declined over the period indicating that

relatively low-income households are being employed in these activities in the lower productivity end. The concentration of income from services is still higher than the income from rice farming. The components of the Gini coefficients show that the increase the increase in income inequality over 1987-2000 was mainly due to two sources- business and non-rice agricultural activities. The contribution of rice farming (which is usually perceived as a highly concentrated source of income) to concentration of total income in fact declined over this period.

V. Rural business enterprises

Trade and business enterprises accounted for 22 per cent of the rural non-farm employment and nearly 43 per cent of the income generated from the rural non-farm sector. Thus, labor productivity in business is almost double of that for other rural economic activities. The income from these activities grew at the highest rate. Also, a large proportion of workers reporting non-farm labor as primary occupation were employed as wage laborers in these enterprises. Thus the business sub-sector is the most dynamic in RFNE. What are these business enterprises? How are they financed? The answer to these questions may be useful for operational purposes, i.e., for development of programs and policy support for RFNE.

In the 2000-2001 survey, we asked households that reported business as primary or secondary occupations to specify types of business activities, the amount of capital employed, and the source of finance- to assess the linkage of business enterprises with agriculture and to analyze financial constraints. The activities found are grouped into the following classes to study linkages with agricultural production activities:

- Agricultural inputs related: Irrigation pumps, fertilizers, spare parts, power tillers, small agricultural implements, threshing machines, and pesticides.
- Crop output related: Paddy and jute stores, vegetable shops, fruit stalls, betel leaf and nut shops, rice and wheat stall, oilseeds and spices stores.
- Livestock related: Sweetmeat and curds, chicken & eggs, milk trading, butcher shop, cattle trading.
- Fisheries related: Fish trading, fish fingerlings trading.
- Forestry related: Timber trading, fuel wood trading, bamboo and hogla leaves trading.

- Agro-processing: *Gur* (raw sugar) making, rice and flour mills, oil mills, *cheera* and *muri* making, saw mill, fish drying, handicrafts, salt making, goldsmith, furniture making.
- Construction materials related: Hardware shops, cement and rod, lathe machine, brick trading, stone and sands, brick field, lock and key business, bamboo fixtures, contractor for road and bridge construction, tin and iron trading.
- Transport operation related: Vehicle renting, leasing ferry *ghat*, trawler renting, repairing rickshaw/van, transport business.
- Food services: Tea stall, peddling tea, restaurants.
- Others: Cloth shops, readymade garments, tailoring, phone and fax machines, electronics, utensils, glass, cookeries.

The agricultural inputs and crop-output related enterprises comprised nearly one-third of the total business enterprises; but accounted for only one-sixth of the total capital employed in these enterprises **(Table 10).** This indicates the small-scale nature of these enterpries. The livestock, fisheries and forestry products related enterprises accounted for another 16 per cent of the rural enterprises and 13 per cent of the total capital employed. Agro-processing enterprises accounted for only six per cent of the units and employed similar proportion of capital. Grocery stores that serve basic consumption needs of daily life of the rural inhabitants accounted for nearly 14 per cent of the units. **Thus, nearly 56 per cent of the business enterprises were agriculture related.**

Table 10. Importance of different trade and business activities and the average size of capital, 2000

Type of trade and business	Share of enterprise (n=566)	Share of capital (percent)	Share of investment last year (%)	Average size of capital (US$)
Agricultural inputs	14.1	8.5	6.6	544
Crop products	20.7	8.2	16.8	358
Livestock products	6.0	7.2	15.0	1093
Fisheries products	4.8	2.1	2.8	398
Forestry products	6.4	3.8	4.7	544
Agro-processing	6.2	5.3	1.7	775
Construction materials	4.9	10.1	12.5	1847
Transport business	4.1	10.5	3.5	2,351
Restaurants	6.7	2.1	0.9	278
Garments	3.7	15.8	9.9	3,851
Grocery stores	13.8	11.2	19.9	735
Other non-agriculture	8.7	15.3	5.6	906
Total	100	100	100	906

Source: IRRI sample household survey

The average size of capital employed in rural business enterprises was relatively small, at Tk 47,000 (US$900) for 2000. The largest size of capital employed was in cloth and garments business (US$4030), transport business (US$2360) and construction materials (US$1840). The lowest size of capital employed was in tea stalls (US$269), trading of agricultural produce (US$ 364) and fisheries products (US$403).

Most of the capital for setting up the business enterprises was financed by own savings. Thus, mobilization of surplus from the increase in agricultural productivity appears to be the initial building block for the development of the rural non-farm enterprises. The contribution of formal financial institutions in setting up the enterprises was relatively small. Only 11 per cent of the initial capital was obtained as loans from commercial banks and another three per cent from NGOs (**Table 11**). The credit from commercial banks went proportionately more for enterprises dealing with cloth and garments, construction materials, and fisheries and crop products, while the NGO credit went proportionately more for agro-processing and forestry products. Thus, lack of access to credit appears to be a major constraint to the expansion of rural non-farm enterprises.

The meager contribution of NGOs in financing rural business enterprises is noteworthy in view of the vast expansion of credit supply by the big NGOS in Bangladesh, such as Grameen Bank, BRAC, ASA, and many other localized small NGOs funded by the Palli Karma Shahayak Foundation (PKSF). The BIDS-IRRI surveys estimated that that share of institutional sources in the total supply of loans increased from 27 percent in 1987 to 63 percent in 2000; two-thirds of the expansion was due to the supply of credit from the NGOs. But the average size of loan provided by the NGOs was so small (US$ 118) that it was inadequate to meet the needs of the business enterprises. NGOs should consider increasing the size of the loan to cater to the needs of this sub-sector.

Table 11. Sources of financing of initial capital and investment made in the last year, 2000

(figures in percent of total)

Source of capital	Initial capital	Investment in the last year
Commercial banks	10.9	9.3
NGOs	2.6	4.4
Money lender	3.7	6.1
Friends & relatives	6.0	2.2
Own savings	71.6	76.2
Sale of assets	5.2	7.9
Total	100.0	100.0

Source: IRRI sample household survey

VI. Demand for non-farm goods and services

An important constraint to the expansion of RFNE could be a sluggish demand for the non-farm goods and services. An expansion of supply in the face of a sluggish growth in demand would lead to a decline in prices and profitability and provide disincentives for further expansion. In Bangladesh, agriculture has been growing at a slow rate, hence agricultural income may be a weak stimulant of the growth of non-farm economy. But since non-agricultural income now accounts for more than half of the rural income, and many farm households are simultaneously engaged in farm and non-farm activities, the growth on non-farm income itself would be a strong stimulant of the growth of RFNE.

In this section we assess the nature and extent of the effect of income growth on the demand for non-farm goods and services by analyzing the pattern of consumption expenditure for both rural and urban households. The analysis is based on unpublished data of the 2000 Household Income and Expenditure Survey conducted by the Bangladesh Bureau of Statistics (BBS). The data were collected from a random sample of 5040 rural households and 2400 urban households. The household level raw data obtained from the BBS were checked for consistency (such as zero consumption for some items absolutely necessary for survival, and unusually high per capita consumption for certain individual items which is highly unlikely) and edited for this analysis. **The average household income estimated from the survey was US$212 for rural households, and US$415 for urban households.**

We have estimated the expenditure pattern by fitting the following non-linear function developed by Hazell and Roell (1983):

$$\mathbf{S_i = b_i + a_i/Y + c_i\ LogY} \qquad \text{……. (1)}$$

Where,

$\mathbf{S_i}$ is the share of the expenditure on the *i*th consumption item ($\mathbf{E_i}$) of total household income, **Y**. **a**, **b**, and **c** are the parameters of the expenditure function.

Equation (1) is the reduced form of the non-linear Engel function:

$$\mathbf{E_i = a_i + b_i\ Y + c_i\ Log\ Y} \qquad \text{……. (2)}$$

Equation (1) is chosen instead of equation (2) because by normalizing expenditure on individual item ($\mathbf{E_i}$) by dividing by income, **Y**, removes the econometric estimation problem of heteroskedasticity common in the use of cross-section data. A disadvantage of estimating the share equation is the value of R^2 coefficient is typically smaller (Prais and Houthakker, 1971).

The marginal and average income share and the income elasticity of demand can be estimated from the equation 1 as follows:

Marginal income share (**MIS**)= $\mathbf{b_i + c_i\ (1+\ Log\ \hat{Y})}$,
Average budget share (**AIS**) = $\mathbf{\hat{S}_i}$,
Income elasticity of demand= **MIS/AIS**.

In estimating the model it is not necessary to impose any restriction to ensure that the sum of the marginal income share is equal to 100. The way the model is specified, this condition is automatically fulfilled. The estimates of the parameters of the model by Ordinary Least Square (OLS) method are reported in Appendix Table 1 and 2 for rural and urban households respectively. The estimates of the average and marginal income shares and the income elasticity of demand derived from the parameters can be reviewed from **Table 12**.

Table 12. The pattern of expenditure for rural and urban households, 2000

Items	Rural households			Urban households		
	Average share of income (%)	Marginal share of income (%)	Income elasticity	Average share of income (%)	Marginal share of income (%)	Income elasticity
Food:	51.91	33.50	0.65	41.15	24.08	0.58
Cereals	24.82	7.37	0.30	16.02	3.74	0.23
Non-cereal crops	14.55	10.48	0.72	12.28	6.79	0.55
Fruits	1.47	1.69	1.15	1.55	1.61	1.04
Fish	6.30	6.80	1.08	5.66	4.92	0.87
Livestock prod.	4.77	7.16	1.50	5.64	7.02	1.25
Manufactures:	19.80	16.57	0.84	18.18	14.11	0.78
Clothing	5.72	5.26	0.92	5.09	4.09	0.80
Other industrial	14.08	11.31	0.80	13.09	10.02	0.77
Services:	17.13	26.10	1.52	26.94	37.54	1.39
Housing	6.19	7.32	1.18	11.94	15.54	1.30
Education	4.05	8.25	2.01	6.40	10.90	1.70
Health care	2.33	2.63	1.13	2.07	1.91	0.92
Transport	2.51	4.31	1.70	3.24	5.35	1.65
Recreation	0.66	1.56	2.36	0.77	1.40	1.82
Other services	1.39	2.03	1.46	2.52	2.44	0.97
Savings	11.16	23.83	2.13	13.73	24.27	1.77

Note: Estimated from parameters reported in appendix tables 1 and 2.
Source: BBS (unpublished household level data), Households income and expenditure survey 2000.

The results show that rural households spend about 52 percent of their incomes on food items, which are produced in agriculture. But they spend only 34 percent of their incremental income on food. The income elasticity of demand is estimated at 0.65, indicating that a 10 percent increase in income would lead to a 6.5 percent increase in the demand for food items. Within the food items the market is strong for non-crop agricultural activities- fruits, fisheries and livestock products, which have elastic demands. Within the crop sector the market is weak from the cereal crops (rice and wheat), more so for urban households. Rural households spend only 7 percent of their incremental incomes on cereals, and urban households a meager four percent. Thus, the market for these products expands only marginally with the growth of incomes. The incremental budget share and the income elasticity of demand are much higher for non-cereal crops (potato, vegetables, oilseeds, pulses, spices, sugarcane and tobacco) than for cereals. The livestock products have the highest income elasticity of demand among the food items, and cereals the lowest, both for rural and urban areas. Since non-cereal crops

and non-crop agricultural products are more perishable in nature and have higher marketable surplus, the findings indicate stronger potential for the expansion of market for rural processing, storage, trade and transportation activities.

Weaving of low-cost clothing (*sari*, *thaan* and *gamchha*), and processing of paddy are the major rural industrial activities in Bangladesh. With the development of rural infrastructure, and increasing purchasing capacity of the rural households, these products are facing competition from improved quality products manufactured in urban areas. So, rural households are spending a larger share of their income on industrial goods produced in urban areas, than on low-quality but low-price products produced in home-based rural industries. For 2000, the marginal income share of manufactured goods is estimated at 17 percent for rural households and 14 percent for urban households. For 1982, Ahmed and Hossain (1990) estimated the budget share for manufactured goods at 10.5 percent for technologically backward villages, and 12.4 percent for technologically progressive villages. With increased transaction of industrial products in rural areas the demand for transport and trade services has been increasing.

Households spend a fairly large proportion of their incomes on services, and their market has been growing, as indicated by very high income-elasticity of demand. Rural households spend 26 percent of their incremental income on service sector products, and urban households 38 percent. The highest income elasticity of demand is for education, transport and recreation. The estimates of income elasticity indicates that with 10 percent increase in incomes, the rural households will increase the expenditure on services by 15 percent, and urban households by 14 percent.

The findings amply demonstrate that market is unlikely to be a major constraint for rural trade, transport and other services. Since the non-farm income is now a major component of the rural income, and the rural income has been growing in spite of the sluggish performance of agriculture, the respectable growth in non-farm income itself with generate demand for non-farm goods and services.

VII. Strategies and policies

Researchers on rural industries identified major constraints on the development of the sector as shortage of finance, deficient entrepreneurship, traditional technology, low quality of output, inadequate infrastructure and marketing facilities, and unfair

competition with large and medium scale Industries due to discriminating macro policies (Ahmad 1984, Mandal and Assaduzzaman 2002). The government recognized most of these problems as early as in late 1950s when the First Five Year Plan of Pakistan (1955-60) was formulated. The government created a number of institutions such as the Bangladesh Small-scale and Cottage Industries Corporation (BSCIC), Handloom Board, and Sericulture Board, to cater to the needs of small scale and cottage industries, but they were inadequately backed by allocation of financial resources and appropriate management support to ensure sound institutional health.

The government of Bangladesh also recognized the importance of rural non-farm activities, particularly for generating productive employment. The Second Five Year Plan (1980-85) of Bangladesh noted, "As employment and income cannot be adequately generated in the farm sector to sustain agricultural development in spite of the fact that modern agricultural technology is quite labor intensive, non-farm employment opportunities should be created. The dispersal of industries and the emphasis of rural industries will help attain this goal" (p. 192).

As a strategy for the development of rural non-farm activities, the Second Plan proposed the development of rural **'growth centers'** in important market places as catalytic agents for rural development. The Plan proposed to establish a large variety of rural industries, in and around the growth centers. Manufacturing of rural transport equipment, agricultural implements and machinery, agro-processing, and machinery and equipment for handlooms were identified as the key industries to be promoted. The Plan proposed to establish some basic facilities such as foundries and repair shops at the growth centers. The Plan also proposed that 200 workshops would be established under public sector sponsorship as pioneering ventures to overcome the inertia of the private sector at the initial stage. After successful completion and operation of the workshops, those would be disinvested to interested private entrepreneurs.

The Third Five Year Plan (1985-90) proposed to set up **Employment and Resource Centers** at the thana level for the promotion of rural non-farm employment. The Centers would have training and demonstration units for the development of local crafts and new product lines. The planners also proposed to strengthen the technology development and extension work of the Bangladesh Small and Cottage Industries Corporation, the Handloom Board, the Sericulture Board and the Institute of Appropriate Technology. The Plan proposed to establish a **National Coordination Council** to formulate policies,

coordinate the activities of various agencies engaged in the promotion and financing of rural non-farm enterprises and to review performance and achievements of such agencies.

The Fourth Plan (1990-95) focused more on appropriate policies than on institutional development for promotion of the rural non-farm sector. The policies proposed in the Fourth Plan include (a) appropriate reform in exchange rates and tariff policies to remove the bias against rural industries, (b) restructuring of the licensing system so that small scale and cottage enterprises can benefit from the system, (c) developing mechanism for identification of real entrepreneurs and establishment of a system of supervised credit without collateral security, (d) integrating credit with training and technology extension program and e) consolidating the operation of BSCIC so that limited financial and managerial resources are not spread thinly over too many projects. The Fourth Plan also recognized the role of the public sector organizations in the development of skills of the poor and other disadvantaged groups through motivation and training. It also proposed to encourage, coordinate and integrate NGO activities with public sector programs.

The policy statements in Plan documents, however, remained mostly as pious intentions. The 'growth center' concept was promulgated by the then Minister of Planning and was forgotten after he left the government, The National Coordination Council proposed in the Third Plan also remained on paper. Every development plan presented institutional and policy support for rural non-farm enterprises as “old wines in new bottles” without explaining why the policies of the previous plan were not implemented. Thus, institutions, strategies and policies needed for the promotion of the rural industrial activities have already been identified. What is lacking is political will and financial support for implementing them.

However, the needs of the rural trade, transport and other service activities have never been explicitly assessed in planning documents. As we noted earlier these are more important components of the rural non-farm sector than rural industries. However, two public sector programs which have indirectly helped expansion of the non-farm non-farm activities are (a) the development of the rural road network since the mid-1980s, (b) the expansion of rural electrification and c) improvement in functional literacy. Progress in the first two areas has been highly respectable during the 1990s due to expanded activities of the Local Government Engineering Department and the Rural Electrification

Board. Financial support for these institutions should continue for expansion, maintenance and quality improvement of their services.

The Bangladesh Agricultural Development Corporation (BADC) may also be reorganized for providing training on the operation and maintenance of agricultural and non-farm machinery particularly for rural youth who dropped out from secondary schools. BADC may also establish storage and processing facilities for perishable products, and invest in developing a fleet of modern transport with refrigeration facilities, the services of which may be rented-out to rural traders and entrepreneurs.

VIII. Conclusions

Land, the dominant factor in agricultural production, is extremely scarce in Bangladesh. Access of rural households to land has been eroding due to continued growth of population and limited employment generation in the formal industrial and service sector activities. Nearly half of the rural households are "functionally landless" owning less that 0.2 ha of land that cannot be a significant source of income. The average size of farm holding has declined from 1.70 ha in 1960 to 0.91 ha in 1983-84 and 0.68 ha in 1996. Thus the capacity of agriculture to generate productive employment and provide a decent standard of living is becoming increasingly limited.

Rural households recognize these problems and have been trying to address them by utilizing the surplus generated by the technology- induced growth in agricultural productivity for undertaking rural non-farm activities. They are also investing on education of children, for facilitating occupational mobility from manual labor-based activities to human capital-based services. As a result, the rural non-farm sector has been expanding and has already become a major component of the rural economy. The share of non-agriculture in rural household income has grown from 36 percent in 1982 to 42 percent in 1987, and further to 54 percent in 2000. The share of non-agriculture in rural employment has increased from 34 to 52 percent over 1987-2000. The distribution of income from trade and services however remains a concern because of availing of the new income earning opportunities by households that have better access to education and physical capital. The worsening of income inequality in rural areas is mainly on account of the increased share of income from business and services, which are more unequally distributed than the income from agriculture. It is a challenge to policy makers to devise

and implement programs and policies that facilitate the distribution of non-farm employment in favor of land-poor households.

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Appendix Table 1. Expenditure function: Rural households, 2000

Items	Constant term	Inverse of per capita income	Logarithm of per capita income	R^2
Food	1.956	327 (46.8)	-0.1750	0.72
	(0.052)		(0.0051)	
Cereals	1.026	660 (35.1)	-0.0940	0.74
	(0.069)		(0.0039)	
Non-cereal crops	0.929	-333 (26.2)	-0.0810	0.31
	(0.029)		(0.0029)	
Fruits	0.080	-69 (11.0)	-0.0062	0.09
	(0.012)		(0.0012)	
Fish	0.460	-358 (22.7)	-0.0387	0.05
	(0.025)		(0.0025)	
Livestock products	0.228	-322 (30.0)	-0.0154	0.06
	(0.034)		(0.0032)	
Manufactures	0.986	-399 (37.5)	-0.0810	0.14
	(0.042)		(0.0041)	
Clothing	0.292	-156 (16.3)	-0.0237	0.04
	(0.018)		(0.0018)	
Other industrial products	0.694	-242 (31.1)	-0.0573	0.13
	(0.035)		(0.0034)	
Services	-0.502	-118 (67.1)	0.0753	0.18
	(0.075)		(0.0074)	
Housing	0.061	-83 (33.6)	0.0012	0.01
	(0.038)		(0.0037)	
Education	-0.571	184 (43.8)	0.0665	0.12
	(0.049)		(0.0048)	
Health care	0.137	-113 (21.5)	-0.0109	0.06
	(0.024)		(0.0024)	
Transport	-0.119	-16.5 (27.3)	0.0159	0.05
	(0.031)		(0.0030)	
Recreation	-0.096	16.6 (14.1)	0.0110	0.05
	(0.016)		(0.0016)	
Savings	-2.208	941 (90.4)	0.2413	0.26
	(0.101)		(0.0099)	

Note: Figures within parentheses are standard error of estimated coefficient. Number of cases is 5040. See text for explanation of the model.

Appendix Table 2. Expenditure function: Urban households, 2000.

Items	Constant term	Inverse of per capita income	Logarithm of per capita income	R^2
Food	1.189	950 (51.6)	-0.1018	0.81
	(0.040)		(0.0037)	
Cereals	0.529	959 (35.7)	-0.0463	0.80
	(0.028)		(0.0026)	
Non-cereal crops	0.659	-8.3 (26.9)	-0.0555	0.60
	(0.022)		(0.0021)	
Fruits	0.081	-84.4 (12.4)	-0.0061	0.02
	(0.010)		(0.0009)	
Fish	0.355	-266 (27.2)	-0.0287	0.10
	(0.021)		(0.0020)	
Livestock products	0.334	-482 (37.9)	-0.0248	0.07
	(0.029)		(0.0027)	
Manufactures	0.897	-378 (48.3)	-0.0710	0.29
	(0.037)		(0.0035)	
Clothing	0.235	-103 (19.2)	-0.0182	0.14
	(0.015)		(0.0013)	
Other industrial products	0.662	-276 (41.1)	-0.0528	0.24
	(0.032)		(0.0030)	
Services	0.031	-921 (108)	0.0324	0.25
	(0.083)		(0.0078)	
Housing	0.040	-632 (73.7)	-0.0145	0.08
	(0.057)		(0.0053)	
Education	0.003	-210 (44.0)	0.0056	0.08
	(0.034)		(0.0031)	
Health care	0.092	-65.5 (29.6)	-0.0068	0.01
	(0.023)		(0.0021)	
Transport	-0.242	82.6 (37.0)	0.0277	0.13
	(0.029)		(0.0026)	
Recreation	-0.043	-11.4 (17.9)	0.0054	0.05
	(0.014)		(0.0012)	
Savings	1.886	1183 (128)	0.2000	0.29
	(0.099)		(0.0092)	

Note: Figures within parentheses are standard error of estimated coefficient. Number of cases is 2400. See text for explanation of the model.