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***INCOME SURPLUSES AND INVESTMENT PATTERNS OF
SELECTED FARM FAMILIES IN BANGLADESH****

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ABSTRACT

This paper has attempted to measure the extent and level of farm household income surpluses and the magnitude of potential investible capital. Patterns of investment of the selected farm families and factors affecting their investment choices also were analysed. For analytical purposes, sample farmers were categorised into four farm size groups. Findings of the study revealed that in rural areas of Bangladesh farm families operating between 1 acre to 2.5 acres of land could be considered as potential for mobilization of income surpluses. Medium and large farms exhibited substantial positive income surpluses. Investment analysis showed that investment on land purchase and on non-agricultural purposes was highest for the large farms. Smaller farms invested more for improvement of their land resource and on acquisition of livestock resources. This study indicated that the very small farms in particular and some other small farms upto 2.00 acres of operational holding in general require external financing for pursuing productive investment.

I. INTRODUCTION

Magnitude of farm family income surpluses, expenditure patterns and investment behaviour is a matter of concern in policy formulations in connection with financing farm families for agricultural transformation. Growth rate in agriculture largely depends on the increased income available in farm organization and ploughing back of surplus for further investment on farm production activities. A study of investment patterns of

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farm families would help reveal their preferences for spending disposable income and effect of income change on investment behaviour of the farm households. Micro-level study dealing with income surpluses and investment behaviour of rural farm households in Bangladesh is very few and inadequate for effective policy formulations. Nothing much is known about the magnitude of rural farm surpluses and investment in most of the developing countries and available data present somewhat different view of the rate of saving in rural areas of the developing countries (Alamgir 1976, p.4).

The present study was undertaken with the following specific objectives :

- (a) to estimate the level of income surplus of the rural farm households in order to assess the magnitude of potential investible capital at the disposal of rural farm households of different farm sizes.
- (b) to examine the patterns of investment of the selected farm families and factors affecting their investment choices to help formulate appropriate financing strategies for rural farm households.

Definitions of annual income, disposable income, income surplus, investment expenditure and other terminologies used in this study are provided in section II of the paper. Source of the data and methodology of the study are discussed in Section III. In Section IV, quantitative and analytical results obtained are discussed. This article is concluded in Section IV with some remarks on policy implications of the study and suggested areas of further research.

II. CONCEPTS AND DEFINITIONS

Annual Income

Annual income was considered in terms of both agricultural and non-agricultural income. Income from agricultural sources included value of the crops produced, value of the livestock products, wages received from others for farm work, and value of sale of agricultural assets during the year. Non-agricultural income included non-agricultural labour, business income, earning from service and profession, sale proceed of non-agricultural assets during the year, borrowing from institutional and non-institutional sources and other remittances from outside.

Disposable Income

Disposable income was used in this study to test functional relationship between consumption expenditure, investment and income surpluses. Disposable income was derived by deducting variable cash expenses on farm activities, loan repayment and taxes from annual gross income. This is the income which farmers spend for maintaining their

livelihood in the form of consumption expenditure, expenditure on durables and acquisition of assets, conspicuous expenses, investment expenditures and others.

Consumption Expenditure

Consumption expenditure is a broad term and often have been used to define all consumable household expenditure (including expenditure on social ceremonies, stimulants and educational expenses) and expenditure on durable household goods (Rai, Grove and Nandal 1972, p. 76). Taxes paid also have been included in some studies as consumption expenditure (Alamgir 1976, p. 10) . Alamgir has also observed two problems in defining the domain of consumption expenditure. The first is the general problem of the treatment of consumer durables and the second relates to the question of dichotomy between consumption and investment in a situation when consumption may increase productive capacity as much or more than physical investment which is particularly relevant for rural households at or below subsistence level in developing countries. The scope for controversy exists in using household durables as capital expenditure and hence as saving investment, and also as current expenditure and hence consumption expenditure (Alamgir 1976, p. 17).

In this study consumption expenditure was used to mean only essential consumption by the rural households which included food stuff and related items, apparels, repairing of houses and stimulants. These are some items which farm households have to incur essentially and have little or no other option before meeting up these demands fully or partly. Expenditure on household durables, education and on conspicuous items have not been considered as essential consumption and none of these have also been considered as investment in this study.

Investible Surpluses

In order to arrive at the investible surpluses of the farm families, essential consumption expenditure was deducted from the disposable income of the farm families. The investible surplus is retained after deduction of variable cash expenses and essential consumption from the annual gross income of the farm families. Thus the surpluses measured would tend to be high in magnitude than the net savings of the farms which is defined as the difference between changes in assets and changes in liabilities adjusted for capital transfers and capital gains and losses in an accounting period (Singh and Gugnani 1975, p. 5). Investible surplus at the disposal of the farm families is the income leftover which farm families may invest either on productive farm investment or may waste on conspicuous consumption purposes or may save partly or in whole. Having this in mind, investible surpluses of the farm families were derived and tested for different functional relationships.

Investment Expenditure

Investment as considered in the present study included only the expenditure in acquisition of capital assets for production, expenditure on land improvement, purchasing farm machinery, tools, building farm houses and sheds, and other business investments.

III. METHODOLOGY OF THE STUDY

A cross-section of 111 farm families from three villages of three different geographical locations of Bangladesh were purposively selected for this study. The selected farmers of the village Douhakhola (under the District of Mymensingh) had access to deep tubewell irrigation facility during Boro/Aus season. From Douhakhola 38 farms of different size groups were randomly chosen for the study. The second village selected was Boyra, 4-5 miles away from the Mymensingh district headquarters. The village is well connected by roads and have good access to market with the district headquarters. Islamabad, a remote village in terms of road communication and accessibility, under the district of Chandpur was another sample village. A total of 38 farms and 35 farms of different size groups were randomly selected from the above two villages respectively.

Information were collected from the farmers of these three villages, different in geographical locations providing data attributes of a wide range of situations. The data collected refer to the year 1984-85. Family budgets giving income and expenditure data by sources was worked out for each household in the sample. Data were collected through survey method with structured questionnaires.

For analytical purposes, sample farmers were categorised into four farm size groups. This helped identify very small/marginal farmers and help comparability of economic performances and potentials of resource poor farmers with relatively larger farmers. The four farm size groups were (i) very small farms operating upto 1 acre of land (ii) small farms, above 1 acre upto 2.5 acres, (iii) medium, above 2.5 acres and upto 5 acres of land and (iv) large farms, having land above 5 acres.

IV. MEASUREMENT OF INCOME, CONSUMPTION, INCOME SURPLUSES AND INVESTMENT

Family Structure, Land Holding and Income

Annual gross income per family and per capita, average family size, earning person and operational holding are shown in Table 1. The range of variation of income per capita and per family was Taka 2162 to Taka 5232 and Taka 12,627 to Taka 56,248 between very small farm and large farm respectively. The range of land under operation between

very small farm and large farm was 0.6 to 6.25 acres. Per capita income estimated for 45 farm families in Dhaka district in 1982-83 was Taka 3240 (Choudhury *et. al.* 1985, p. 24).¹ Gross domestic product per capita for whole of Bangladesh in 1983-84 was Taka 3459 (BBS 1984-85, p. 389).

TABLE 1. DISTRIBUTION OF SAMPLE FARMS, THEIR MEAN OPERATIONAL HOLDING, FAMILY SIZE, EARNING PERSON AND ANNUAL GROSS INCOME PER FAMILY AND PER CAPITA

Farm category	Sample farms	Operational holding, acres	Family size	Earning person	Annual Gross Income (in Taka)	
					Per family	Per caput
Very Small	25	0.60	5.84	1.48	12627	2,162
Small	48	1.67	7.39	2.21	22784	3,083
Medium	26	3.68	8.22	2.54	36313	4,418
Large	12	6.25	10.75	3.58	56248	5,232
All categories	111	2.40	7.60	2.27	27526	3,622

Average family size, earning persons, operational holding and annual income per family have shown positive correlations with farm size. The income of the large farms was approximately 4.45, 2.47 and 1.55 times higher than the incomes of the very small, small and medium farms respectively. To test the functional relationship between gross annual income as dependent variable, operational holding and earning person per family as explanatory variables, straightline regression equations were fitted. Regression equation for income to the size of operational holding and the number of earners per family for all farms fitted are as follows :

$$Y_i = 6200.89 + 6272 X_1^{**} + 2765 X_2^{**} \quad R^2 = .60$$

(9.62) (3.17) F-ratio = 78.90

where Y_i = annual gross income per family, X_1 = operational holding per family, X_2 = earning persons per family,

(Figures in the parentheses denote t-values **Significant at 1 percent level.)

Multiple regression equation when fitted for different size groups of farms did not turn out to be significant in terms of their R^2 values. Size equations exhibited very low

NP values and this might have happened because of high variability of income, operational holdings and earning persons within different size groups of farms. Log linear form of functional relationship tested for different size groups of farms and for that matter for all farms did not turn out to be satisfactory. The variation in annual income was explained about 60 percent by land and labour for all farms. The marginal productivity figures of both land per acre and labour per man unit for the sample farms were Taka 6270 and Taka 2764 respectively annually. Marginal productivity of an acre of land was 2.27 times higher than an earning person in a farm family.

Level of Farm Family Consumption, Investible Surpluses And Actual Investments

Per capita and per family disposable income were both found to have increased as farm size increased. Per capita disposable income of a large farm was 2.30 times higher than a very small farm. Very small farms usually possess little leftover of their products after meeting family consumption requirements in a subsistence farming situation. It is evident from Table 2 that the very small farms surpassed their income even to meet only essential consumption like food items, apparels and medicine expenses. On an average farm families having operational holding above one acre of land had positive surpluses after meeting essential consumption requirements. This amount of positive surplus for

TABLE 2. PRODUCTION COST (PURCHASED INPUTS ONLY), DISPOSABLE INCOME, COST OF ESSENTIAL CONSUMPTION AND INVESTIBLE SURPLUSES

Farm category	Cash expenses for production (per acre)	Disposable Income (Tk.)		Essential Consumption		Investible surpluses	
		Per family	Per caput	Per family	Per caput	Per family	Per caput
Very Small	1351	11816	2023	14734	2523	-2918	-500
Small	1133	20886	2824	17755	2401	3132	423
Medium	926	32901	3997	22004	2673	10897	1324
Large	978	50132	4663	31524	2932	18607	1731
All farms	1097	24819	3264	19558	2572	5261	692

large farms was approximately 4 times higher than small farms. The range of per capita essential consumption expenditure was Taka 2523 to Taka 2932.

The variance of essential consumption requirement per capita amongst different size groups of farms was small. Farmers having below one acre of land were by and large dissaver. None were dissaver amongst medium and large farms. Small farms spent 85 percent of their disposable income for essential consumption requirements. Medium and large farms spent 67 and 63 percent of their disposable income for essential consumptions. All farms together spent 72 percent of their total gross income for essential consumption expenditure. Alamgir found in the rural areas of Bangladesh about 70 percent of total expenditure is devoted to food and related items (Alamgir 1973, p. 780). So, the other way round, investible surpluses for small, medium and large farmers were 15, 33 and 37 percent of their disposable income in absolute terms (Table 3).

TABLE 3. CONSUMPTION INCOME RATIO PER FAMILY AND SURPLUSES AS PERCENTAGE OF DISPOSAL INCOME

Farm category	Consumption as percentage of Gross Income	Consumption as percentage of Disposable Income	Investible surplus as percentage of Disposable Income
Very Small	117	125	-25
Small	78	85	15
Medium	61	67	33
Large	56	63	37
All categories	72	79	21

For testing functional relationship between disposable income and investible surpluses the following functions were derived :

(i) Very Small Farms	$S = -11329.74 - 61**Y_d$ (3.24)	R^2 .32	R .56
(ii) Small Farms	$S = -11353.28 + .59**Y_d$ (11.11)	.73	.85

(iii) Medium Farms	$S = -16042.29 + .61^{**}Y_d$.71	.84
	(7.70)		
(iv) Large Farms	$S = -8139.41 + .43^{**}Y_d$.61	.75
	(3.64)		
(v) All Farms	$S = -10686.47 + .54^{**}Y_d$.74	.85
	(17.21)		

Where S=Investible Surpluses, Y=Disposable Income

**Significant at 1 percent level of probability
 Figures in the parentheses denote t ratios.

In the above regressions, it appears that the disposable income is the most important determinant of investible surpluses of the farm families. For all farms 73 percent of variation in investible surpluses was explained by the variation in household disposable incomes. The correlation coefficient of the very small farms turned out to be very low. They were dis-savers, and therefore, the coefficient of disposable income turned out to be negative. In all other cases, the signs were as expected. The coefficients appeared to be all highly significant. Marginal propensity to surpluses between small and medium farms did not vary much. It was lowest for large farms which implies that they had lower investible surpluses in marginal propensity terms in the study area than other size groups of farms. This indicates that lower land holding farms after certain stages of their consumption tend to retain relatively larger amount of their disposable income. Compared to macro-level estimates of savings these estimates seem to be quite high.²

However, this variation and high rate of observed surpluses is plausible. Firstly, this was due to variation in defining net saving and surpluses. Secondly, even in terms of net saving some cross section studies showed similar high level of rural surpluses in Bangladesh (Habibullah 1963; Rahman 1980). Atiqur Rahman estimated surplus as a percentage of income in Phulpur area of Mymensingh district as about 58 percent in case of large owner farmers (Rahman 1980, p. 27). In the case of India similar variations have been observed between macro and micro estimates. NCAER estimated the overall rural savings rate in India (a macro-study) to be around 3.5 to 5 percent (NCAER 1985). Pawar and Patil in Maharashtra, India found surplus (income minus gross expenditure) to be about 37 percent (Pawar and Patil 1975, p. 14). The marginal propensity to save turns out to be 34 percent to 42 percent in the cross section study of Chauhan *et al.* (1972, p. 28). Nath and Singh found in Deoria district, India, rural marginal propensity to save as high as between .13 to .68 (Pandey *et al.* 1972, p. 36)

Farm investment analysis in this study was restricted only to the description of the magnitude and pattern of investment for different size groups of farms for the study year. This was because the data mostly on cost and rates of return as determinants of investment for the current and lag periods were not available to try investment functions.

Investment on land purchase and on non-agricultural purposes was highest for the large farms. Smaller farms invested more for improvement of their land resources and on acquisition of livestock resources. Non-agricultural investment for very small farms was comparatively high than small and medium groups of farms. Owing to inadequate land resource they had to tap non-agricultural productive sources (Table 4). High non-agricultural investment in the case of large farms might indicate their preference for capital transfer from agricultural sector to non-agricultural sector. Agricultural investment expenditure as a percentage of surplus was low for large farms and on the contrary were high for very small and small farms indicating their high preferences for agricultural activities.

TABLE 4. INVESTMENT PATTERN OF DIFFERENT SIZE GROUPS OF FARMS (IN PERCENTAGES TO THE TOTAL INVESTMENT)

Farm category	Agricul. invest-ment as a per-centage of surplus	Agricultural Investments					Non-agricul invest-ment
		Land pur-chase	Land improve-ment measures	Tools machinery and repairs	Live stock	Farmhouses and cattle sheds	
Very Small	—	0.15	49.00	7.25	25.0	1.00	17.60
Small	73	3.00	35.12	12.10	44.0	1.00	5.50
Medium	63	9.89	24.20	12.00	47.10	2.13	4.68
Large	62	26.52	22.00	6.00	20.00	6.10	19.37
All	66	10.00	33.00	9.00	34.00	3.00	12.00

V. CONCLUSION AND IMPLICATIONS

From this study it can be concluded that in some rural areas of Bangladesh farm families having operational holding between 1 and 2.5 acres of land could be considered as potentials for mobilization of investible surpluses. Medium and large farms also exhibited substantial positive investible surpluses at their disposal. The absolute magni-

ratio of surplus and surplus as a percentage of income increased with farm size. Farmers having less than 1 acre of land were dissavers and consumed 25 per cent above what they earned.

The widely prevalent view that capital scarcity at farmers disposal was the cause of low agricultural investment and capital formation in Bangladesh appeared not to be tenable. The magnitude of saving in marginal term was observed lower for large farms than other size groups. Investment behaviour of the farms revealed that the large farms had lower percentage of investment on land improvement and exhibited high trend of non-agricultural investment. Very small and small farms showed their tendency for higher investment on land improvement and acquisition of livestock than large farms. This indicated that very small and small farms had tendency for more use of their land resource. Agricultural investment as a percentage of surplus was the lowest for large farms revealing their low preferences for agricultural pursuits. The causes and factors influencing agricultural and non-agricultural investment preferences by different size groups of farms deserve thorough investigations in deciding strategies for public investments in rural areas. Socioeconomic and institutional factors causing low agricultural investments by the capital surplus farms in rural areas should thoroughly be looked into in order to designing financing strategies for farm households.

This study also indicated that the very small farms in particular and some other small farms upto 2.00 acres of operational holding in general require external financing for pursuing productive investments. Very small farms need external fund for meeting consumption requirement upto the extent of their dissaving. Before fulfilling this requirement, any external fund support would tend to be diverted from their productive uses. Amount of credit to be provided for these very small poor farms should, therefore, satisfy both their consumption and production requirements.

Notes

1. Income (gross receipts) in this study has been defined to include all farm and non-farm income derived from monetized activities. Farm income included value of all agricultural products and by-products property rental receipts in both cash and kind. Non-farm income included all non-farm business, receipts, salaries, wages and pension excluding borrowing and imputed value of family labour and oxen.
2. Asbjorn Bergan estimated gross personal saving as a percent of gross personal income (before taxes) as 12 percent for rural areas of Bangladesh (Bergan 1967, p. 185). Alamgir estimated marginal propensity to save in rural areas of Bangladesh as 12.5 percent during 1964-70 (Alamgir 1974, p. 788).

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