

# SUSTAINABLE AGRICULTURAL DEVELOPMENT: THE ROLE OF INTERNATIONAL COOPERATION

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*Informal Credit Markets in Bangladesh Agriculture: Bane or Boon?*

INTRODUCTION

Agricultural growth occurs through capital accumulation and technical change. The modern HYV technology, which has been the vehicle of growth in agriculture since the late 1960s, is capital-intensive in the sense that it increases the share of capital inputs in total output. It also represents technical change in that yields and factor productivities (including that of labour) are increased (Bhalla, Alagh and Sharma, 1984). Mundlak (1988) points out that capital accumulation leads to the employment of capital-intensive techniques and to a switch to modern technology and that 'it is impossible to increase the relative importance of the modern techniques without capital accumulation'.<sup>1</sup> Thus policies that extract resources away from agriculture will impact negatively on agricultural performance, while the opposite is true for policies that facilitate flow of resources to agriculture.

Governments have often sought to influence the rate and pace of HYV diffusion through subsidised credit programmes. The traditional view is that credit programmes help to overcome the capital constraint inhibiting adoption of HYV by LDC farmers. It also serves to offset the disincentive effects of an overvalued exchange rate and price controls. A further objective is to stem the flow of 'exploitative' informal credit which is deemed anti-developmental and inadequate.<sup>2</sup>

The traditional view has been criticized on the ground that subsidized credit results in rationing, is highly biased in favour of rich farmers, serves to discourage savings mobilization, and generally leads to a misallocation of resources (Von Pischke, Adams and Donald, 1983). It is also argued that credit programmes are not essential for HYV adoption as the technology involved is highly divisible. The way out is through credit at 'market' rates. Since the bank rate is thought to be a poor indicator of the cost of credit, attention has inevitably been re-focused on the informal credit market, which, despite the bad press, appears to be engaged in legitimate economic roles, and which could point to a more relevant rate of interest. In this paper we explore empirical evidence from Bangladesh to attempt an assessment of the role of informal credit in agricultural growth and technological transformation.

There is a large literature on the link between formal credit and agricultural growth, but few studies have focused on the role of informal credit systems.

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The 'interlocked market' literature (including markets for labour, land and credit) provides a theoretical approach for understanding certain forms of surplus appropriation, exploitation and persistence of under-development in traditional agriculture, but empirical validation has been scarce.<sup>3</sup>

## DATA AND METHODOLOGY

This paper draws heavily on two sources of information: a BIDS study on the nature, structure and role of informal credit markets in Bangladesh (Murshid and Rahman, 1991) and a joint Open University–BIDS study on foodgrain market participation by rural households and traders (Crow and Murshid, 1990). The latter study generated detailed data on informal financing of trade and participation of different types of rural households in informal credit markets. Prolonged field stay enabled us to generate excellent panel data on a sensitive subject.

Our data relate to two types of rural settings: (a) an agriculturally backward area where a single paddy crop is cultivated under traditional rain-fed conditions, where there are few other economic activities present, and where the potential for technical change is very limited, owing to a weak irrigation potential;<sup>4</sup> (b) an agriculturally advanced area, where HYV cultivation has made great strides under controlled irrigation. The type and incidence of different forms of informal credit in each of these settings is reviewed in terms of the likely impact on agricultural performance.

We are concerned mainly with the demand side of informal credit and we have implicitly assumed that supply will change only sluggishly and that, over a period of a year and a half, supply changes will reflect seasonal change rather than a change in trend.

### *Area Description*

The evidence produced here relates to two very different geo-ecological areas of the country (Table 1). These areas are characterized by considerable differences in cropping patterns, social organization and the level of technological development. Our backward area, situated in the south of the country, on the confluence of the Meghna River and the Bay of Bengal, is predominantly single-cropped, with the traditional Aman crop cultivation comprising the major agricultural activity. Sharecropping is extensive and constitutes the dominant tenurial arrangement. The ownership of the 'char' lands is often vested with absentee landlords resident in the towns, but who maintain close control over their estates. These landlords are often very powerful, frequently laying claim to many hundreds of acres, and backing up these claims by keeping on call armed retainers known as 'lathials'.<sup>5</sup> This area is normally said to be in net deficit in foodgrain production, but periodically generates a surplus. Agricultural growth has stagnated, with crop output registering a growth rate of 0.3 per cent in recent years.<sup>6</sup>

**TABLE 1** *Socio-economic characteristics of the two study areas*

Indicator	Backward	Advanced
Population per cultd. acre	3.43	4.10
Land cultivated per household	1.84	1.23
Land owned per household	0.79	1.20
Area sharecropped (%)	66.0	30.1
Cropping intensity	0.89	1.78
Literacy Rate <sup>1</sup>	25.9	60.7

*Note:* <sup>1</sup>Persons over 12 years of age reporting ever going to school.

The advanced area to the north of the country is situated in the very old alluvium of the Barind Tract, unlike the still-active chars. Intensive irrigation development, beginning in the early 1980s, has led to widespread diffusion of modern cultivation practices and technologies. Far-reaching changes in cropping patterns and productivity have occurred. HYV diffusion is almost universal, with double cropping the norm and triple cropping not rare. The dominant tenurial mode is one of owner cultivation, with fixed rent contracts more popular than share rents. The area is generally endowed with a good communication network and is well served by both primary and assembly markets for agricultural produce. It has been designated as a surplus area by the government, especially for purposes of grain procurement by the official food distribution agency. This has been one of the fastest growing areas in the country, with output expanding at over 6 per cent per annum in recent years.<sup>7</sup>

Table 1 clearly brings out some sharp differences between the two areas. Land cultivated per household is greater in the backward area, while the actual ownership situation reveals that households own more land in the advanced area. Sharecropping is much more prevalent in the former (66 per cent of area) compared to 30 per cent in the latter. The low cropping intensity and the literacy rate also confirms the relative backwardness of the backward area.

### THE DIVERSITY OF INFORMAL CREDIT

There is a great variety of informal credit arrangements in operation in rural Bangladesh, with considerable regional variation in terms of incidence and type. Most of the major forms reported in the literature were found in our study areas.<sup>8</sup>

*Dhaner Upore (DU)*

Dhaner Upore is a cash-for-kind loan or advance sale, taken three to five months before harvest, to be repaid in paddy. Implicit interest rates are very high or, alternatively, if this is viewed as a sale rather than a credit transaction, the price received is well below the market price at harvest. Repayment rates were typically 7 maunds (260 kg) per Tk. 1000 borrowed. Default leads to recalculation of liability and roll-over of the loan. First, the volume of paddy to be repaid is converted to cash at the ongoing market rate and then it is reconverted to paddy at the lending rate, with repayment period extended up to the next harvest. A variant of this system was also frequently observed, where a cash loan is taken two to four weeks before harvest, the principal is repaid in cash at harvest but the interest payment is in the form of paddy. Both these systems are widespread, but appear to be especially popular in poor backward regions.<sup>9</sup>

*Land mortgage (LM)*

This is also widely practised, particularly when credit requirement is large or when alternative sources have been exhausted. The most popular form of LM found in the study areas is transfer of user rights in land in exchange for cash, with the stipulation that such rights will revert back to the owner once repayment is completed. LM is associated with greater distress or urgency than DU. A variant of this system is sometimes encountered in which the land reverts back to owner control automatically at the end of a stipulated period.

*Cash credit with positive interest (CCPI)*

This is widely found all over the country, particularly among non-farm and labour households. Interest rates can be as high as 25 per cent per month. Collateral requirements and repayment period are sometimes stipulated, but this is less common. When collateral is taken, interest rates are usually lower.

*Interest free credit (IFC)*

In this case, amounts involved tend to be small, with transacting parties usually being from the same class, often involved in a web of mutual obligations. Such transactions have a specific, clear local name (for example, karja or hawlat).

*Higher than or highest market price (HMP)*

These are paddy loans repayable in cash at harvest. Two variants are available, depending on the timing of the transaction. If the loan is taken just after

harvest, usually for the whole season (that is until the next harvest), repayment is at the highest price attained over the course of the season (HMP2). Alternatively, for a loan taken later on, when prices being to rise before reaching their pre-harvest peaks, repayment is negotiated at a price that is fixed at a level that is well above the prevailing market price (HMP1). These forms of credit have been reported from all over the country, but seem to be especially popular in areas of grain surplus. Sometimes repayment is in the form of labour (RL), particularly when the borrower is poor and finds it difficult to service the loan.

The relative importance of different credit forms found in our study areas is indicated in Tables 2 and 3, which show that in the deficit, backward area, formal credit contributes very little to credit needs, while in the surplus, advanced area it is the single most important source of credit. A number of informal credit arrangements have been discussed. Of these, the dominant forms are IFC and HMP in the advanced area, and DU, LM and HMP in the backward area. It will be observed that IFC is unimportant in our backward

**TABLE 2** *Structure of credit transactions in advanced and backward areas*

Area	Borrower households(%)	Transactions Nos.	Formal (%)	Informal (%)					
				DU	HMP	LM	CCPI	IFC	RL
ADV	52	57	33.3	3.5	28.1	—	10.5	24.6	—
BACK	88	111	1.8	63.1	11.7	9.0	2.7	8.1	4.5

*Notes:* ADV: Agriculturally advanced area with substantial grain surplus and widespread use of modern irrigation. BACK: backward, mono-cropped area, no irrigation and with sizable grain deficit. See text for definitions of informal loan types.

**TABLE 3** *Volume of Credit by Type*

Area	Credit Per Household	Formal	Informal					
			DU	LM	CCPI	IFC	HMP	RL
ADV	2 003	49 355 (19)	2 000 (2)	— —	1 892 (6)	26 750 (8)	20 150 (16)	— —
BACK	10 093	7 000 (1)	115 475 (70)	72 700 (10)	2 000 (3)	7 700 (9)	43 360 (13)	4 080 (5)

*Notes:* See notes to Table 1. Figures are in Taka (\$1US=36 Taka). Figures in brackets are number of transactions.

area, where per household credit is found to be considerably higher than in the advanced area (Table 3).

Cash requirements are much higher for HYV cultivation, especially under irrigation, relative to cultivation under rain-fed conditions. In the case of the latter, the major elements of cost are labour and draught power, while for irrigated HYV paddy, water and fertilizer costs are very important in addition. A recent estimate suggests that the cash cost of cultivation with the modern technology is more than three times that under rain-fed conditions.<sup>10</sup>

The role of IFM in agriculture will have to be assessed in terms of the use of credit (a) to finance capital investment, and (b) to meet working capital needs. The implicit assumption here is that modern HYV agriculture is associated with greater credit demand to cover increased cash costs of cultivation.<sup>11</sup>

### INFORMAL CREDIT IN A BACKWARD AREA

In terms of the number of transactions and amounts borrowed by rural households from alternative sources of informal finance, our backward area stands in sharp contrast to our advanced area. Table 4 shows the monthly deviation of total outstanding credit from the mean, over a period of 18 months. Total credit reaches a peak in October, tapering off quickly after the harvest in December. A clear bunching of credit from May to August and October to

**TABLE 4** *Deviation of total monthly outstanding credit from mean*

Month	Backward area	Advanced area
Dec 1987	—	0.48
Jan	0.85	0.45
Feb	0.59	1.10
Mar	0.59	1.40
Apr	0.52	1.22
May	1.04	0.65
Jun	0.92	1.55
Jul	0.83	—
Aug	1.10	1.67
Sep	0.97	1.64
Oct	2.43	1.43
Nov	2.36	1.52
Dec	1.68	0.67
Jan 1988	0.58	0.98
Feb	0.62	0.67
Mar	0.47	0.70
Apr	0.55	0.65
May	0.88	0.23

December, is at once apparent. The first period corresponds to the sowing–transplanting period of Aman paddy (the major paddy crop) and the second period coincides with the pre-harvest lean season.

The seasonal movement of total outstanding credit, and its concentration during the transplanting period and the pre-harvest lean period, suggests that both input costs and consumption are important motives behind these transactions. Table 5 shows that over half of the credit volume is reported to have been taken for purchase of agricultural inputs. On the other hand, consumption accounted for 13 per cent of credit.

Three important forms of informal credit were identified in our backward area: a cash-for-kind loan (DU), paddy loans (kind-for-cash or HMP) and land mortgages (LM).

**TABLE 5** *Allocation of informal credit by rural households (percentages)*

Area	Farm inputs	Draught animals	Consumption	Trade	Other	Total
ADV	8.3	3.2	19.5	13.3	55.7	100
BACK	51.2	7.4	13.1	1.2	27.1	100

### *Dhaner Upore*

DU is the most popular form of informal credit in the backward area, a high proportion of which (around 70 per cent) is invested in agriculture. The bulk of DU was found to be financed by large paddy traders in the nearby market town. The relatively large operational holdings and extensive sharecropping means that labour demands are highly concentrated in time. The credit demands so generated are largely met by traders, often lending through local agents. This suggests a flow of resources to agriculture to enable cultivation, indicating a positive role for credit in agricultural growth. There is no doubt that, in the short run, DU enables many cultivators to harvest their crop. The longer-run (dynamic) implications, however, tell a different story: technological possibilities are limited here by scarce irrigation potential; also the incidence of default is high and, combined with rigorous credit terms, causes a net outflow of resources away from agriculture.

The implicit rate of interest, and the ‘loss’ incurred by growers taking DU, are substantial.<sup>12</sup> Under ‘normal’ circumstances, growers are able to sustain this loss to reproduce the system. Default in terms of not being able to meet obligations on time is not rare, and leads to rescheduling of the debt and roll-over of the credit amount (Table 6). Thus the volume of paddy due at harvest will be valued at the roll-over price and then re-invested at the 7 maunds per 1000 rate until the next harvest.<sup>13</sup> An initial debt equivalent to 7 maunds of

paddy is likely to involve repayment of 12.25 maunds, if rolled over to the next season. Of our 25 sample households, 50 per cent reported at least one roll over case. Of these, half reported asset sale and/or land mortgage to enable repayment.

The source of credit is primarily large and medium grain traders, motivated by two factors: acquisition of cheap grain, and utilization of idle finance during the lean trading period. Risk is minimized through a complex and well-organized network of agents and subordinates, so that loans are hardly ever written off. The rules are not totally rigid, with some scope for renegotiation, for example of the roll-over price.

**TABLE 6** *Roll-over cases reported in the backward area*

Case	Original loan(Tk)	Roll-over price (Tk/Md)	Harvest price (Tk/Md)	Asset sale (Tk)	Land mortgage (Tk)
1	25 000	260	210	—	30 000
2	11 000	260	210	—	—
3	7 000	250	210	3 500	—
4	1 000	250	210	4 000	—
5	3 000	250	210	—	—
6	2 500	250	210	—	1 500
7	700	270	210	3 100	—
8	3 500	250	210	1 500	—
9	400	250	210	—	—
10	4 000	260	210	—	—
11	7 000	260	210	—	—
12	500	232	210	—	—
13	8 500	250	210	4 000	9 500

*Notes:* Tk=Taka; Md=Maund.

To recapitulate briefly, DU is the dominant credit form in our backward area, and finances both production and consumption. The terms are hard, but serviceable under 'normal' conditions. In the event of a shock, rapid de-accumulation occurs through asset sale and land mortgage.

#### *Higher than or highest market price*

HMP is a form of paddy loan which has been reported from all over Bangladesh, but is especially favoured in grain surplus area. Individual producers with surpluses, even in a deficit area, may prefer to lend in paddy than in cash. A few cases were reported from the backward area, but none was related to agricultural production. There are nevertheless implications of this type of

loans for agriculture. Since this is the major form of informal credit in the advanced (surplus) area, we will postpone this discussion until the next section.

### *Land mortgage*

Land mortgage is the last but one step removed from outright land sale, and is an attempt to forestall what often becomes inevitable. The use of the land mortgaged out rarely reverts back to the owner, as repayment is difficult. Eleven of our respondents (44 per cent) reported mortgaging out some land in the last five years and only one case of repossession was encountered.

## INFORMAL CREDIT IN AN ADVANCED AREA

The seasonal dispersal of credit in the advanced area is distinctly different, with peaks occurring in February to April and June to November, presumably reflecting the different cropping pattern there. The first period precedes the HYV Boro crop, grown in the dry season under controlled irrigation, and harvested in May–June. The second period corresponds to the Aman crop which is transplanted in June–July and harvested in November–December.

Table 3 indicates that credit per household is much smaller, with informal credit playing a much more modest role. Of the various forms of informal credit, HMP is the most popular. Table 5 shows that only a small part of informal credit feeds directly into the agricultural sector, while loans for consumption and trading are much more important. On the other hand, formal credit sources were found to be important (57 per cent) and do appear to support agriculture. Out of 19 transactions, 14 were for cultivation; similarly 79 per cent of formal credit went to finance agriculture. The informal market, on the other hand, accounted for 100 per cent of the consumption loans, and 100 per cent of the loans for land purchase and house repair. Use of high-cost informal credit is clearly not preferred.

As already noted, HMP is an important form of informal credit here. Its significance for agriculture is not as a source of credit but as an avenue for surplus investment. This aspect is rarely discussed in the literature, and deserves closer examination, especially as there are distinct implications for growers' returns.

Surplus peasants will normally be in a position to play the market and will attempt to derive a higher return through grain storage and sale at the pre-harvest high price period. HMP has opened up new opportunities to the surplus cultivator that allows him a higher return compared to what the market can afford. Around 20 per cent of all households in the advanced area reported lending on HMP. Of those owning 2.5 acres or more of land (that is most of the surplus producers) 66 per cent were HMP lenders, and 78 per cent of the grain outflow from these households was accounted for by HMP. A comparison of returns to growers under HMP with returns from speculative participation

in the paddy market was attempted (Table 7). The advantage of HMP to the surplus grower is clearly brought out.

**TABLE 7** *Relative returns to HMP*

Respondent no.	HMP type	Returns from HMP	Speculative returns
1	HMP1	19.5	9.5
2	HMP1	20.2	4.6
3	HMP1	17.6	9.5
4	HMP2	8.9	2.1
5	HMP2	6.4	-3.6
6	HMP2	17.6	9.8
7	HMP2	20.9	9.8
8	HMP2	15.0	6.7
9	HMP2	11.7	-4.0
10	HMP2	6.4	3.5
11	HMP2	20.0	11.8
12	HMP2	24.3	6.9
13	HMP2	8.9	1.4
14	HMP2	20.8	5.4
Average (simple)		15.6	5.2

*Notes:* Returns from HMP are actual, while speculative returns are hypothetical figures, based on the assumption that the paddy was stocked for sale. Returns are net of marketing costs and adjusted for paddy weight loss, which is likely to have been incurred if the paddy was stored. Prices used to estimate speculative returns were expected prices, which in the event turned out to be higher than actual prices.

### CONCLUDING OBSERVATIONS

In our backward area, informal credit sources were extremely important, but were found to be dominated by trading capital, which appeared to be injecting resources into agriculture. While the immediate impact of this resource flow is beneficial for production, the adverse terms result in a net outflow of resources from agriculture in the longer run. The incidence of default, roll-over and asset liquidation all point in this direction.

By contrast, informal credit sources play a much smaller role in financing agriculture in the advanced area. There is a large and expanding credit demand for HMP, particularly from the processing sector, suggesting a flow of resources out of agriculture. The overall rural sector stands to benefit in two ways: forward linkages tend to be facilitated, as the surplus finds its way into linked activities like processing (a trend that is unlikely to stop just here) and,

more to the point, the return to (surplus) growers is boosted enormously, which should go some way towards raising demand and prices of paddy.

Informal credit systems are not homogeneous. While the main forms are to be found all over the country, some forms tend to be dominant in certain areas, suggesting that the role of credit will vary. In a stagnant, traditional context, informal credit appears to be regressive. Where there is potential for technological change, the particular form of credit that becomes popular could be supportive of such change, helping to promote both agriculture and non-farm activity.

## NOTES

<sup>1</sup>Capital is broadly defined to include both physical and non-physical components (for example, education).

<sup>2</sup>See Rosegrant and Siamwalla (1988, p. 219).

<sup>3</sup>See, for example, Bardhan (1980) for an excellent review of the literature on interlocked markets. See also Rahman, (1979).

<sup>4</sup>This area is part of a newly emerged 'char' land which has been settled only in the last 50 years. It lacks sufficient surface water for irrigation development and the ground water is excessively saline.

<sup>5</sup>The historical sequence of settlement in the Chars, which is not untypical of newly emerged land arising from riverine action, established sharecropping under the control of absentee landlords. Some details of this historical background is provided in Crow and Murshid (1990).

<sup>6</sup>See Parthasarathy and Choudhury (1989).

<sup>7</sup>Ibid.

<sup>8</sup>See Murshid and Rahman (1991) and Maloney and Ahmed (1988) for a review of different forms.

<sup>9</sup>The author has led a number of 'rapid rural appraisals' in recent months and has found these types of credit arrangements to be particularly popular in backward areas of, for example, Mymensingh and Rangpur, which are known to be famine-prone.

<sup>10</sup>See Government of Bangladesh (1991).

<sup>11</sup>See Khandker (1987).

<sup>12</sup>Calculation of the rate of interest is made difficult by the fact that the terms of repayment (usually 7 maunds per Tk. 1000) are not very sensitive to the time-period involved, suggesting limited alternative use for credit. The implicit DU price was Tk. 143 or 70 per cent of the actual harvest price. The interest element for the season implied is 40 per cent.

<sup>13</sup>Roll-over price is the price at which the value of outstanding paddy debt is calculated by the lender. This is usually the price achieved by most surplus farmers or absentee landlords when they sell their paddy (Crow and Murshid, 1990).

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## DISCUSSION OPENING – GERSHON FEDER\*

Dr Murshid's paper describes credit transactions in two areas of rural Bangladesh, attempting an assessment of the role of informal credit in agricultural growth and technological transformation. One of the observations made is that, in the more backward area, formal credit is not as prevalent as in the more advanced area. While this is apparently a supply-side problem due to political or bureaucratic decisions, an explanation would be useful to readers. Secondly, the separation between formal and informal credit in the analysis would only be legitimate if there was evidence that fungibility of the two types of credit across uses (for example, between consumption and production) was not feasible. A discussion on this issue would help, as typically credit is fungible.

The focus of the discussion is on the impact of credit on agricultural growth; the indicator being used is whether there is a net total inflow or outflow of resources from agriculture. The implied conclusion of the paper is that, in the longer term, informal credit in a stagnant area is regressive and harmful to agriculture, as it leads to the outflow of resources from the sector. The real issue of interest is rather whether the informal credit market increases overall efficiency in the rural economy. This issue is not taken up explicitly, although the various indications in the paper (and common sense) suggest it does increase overall welfare. That is, it facilitates both consumption and input use during the period between planting and harvest. If, for some reason, the activity of traders-lenders providing the funding during this interim period were to be prohibited, the most likely outcome would be a lower level of consumption and production and, over the long term, less wealth accumulation. The point that, when a natural calamity takes place, it triggers a loss of wealth through roll-over, on harsher terms, is not crucial in the discus-

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sion of the efficiency impact of informal credit. This is because the most likely outcome in the absence of such credit would be distress sales of land which are another, and more permanent, loss of wealth.