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Financing Agriculture: A Study of Bihar and West Bengal Potato Cultivation

Arun Pandit, N.K. Pandey, Barsati Lal†, K.P. Chandran and Rajesh K. Rana*

I

INTRODUCTION

Institutional finance plays an important role in the adoption of modern technology and in increasing private capital investment in agriculture. Moreover, the elasticity of input use to agriculture credit was close to unity indicating the significant contribution of institutional credit in promoting modern production technology for increasing productivity and production. Institutional finance has even a greater role to play in a country like India where 80 per cent of the farmers are small and marginal who operate 40 per cent of land and are unable to generate enough farm surpluses and re-invest due to their low level of income. Moreover, introduction of modern technology in agriculture has led to intensive use of inputs and the package of practices, resulting in manifold increase in the requirement of production credit. Institutional finance for agriculture may be stated to have started long back (1793) when the system of *taccavi* loan was introduced. Subsequently, Government's agricultural credit policy aimed at increasing the flow of institutional credit at reasonable interest rate to the agricultural sector. The policy measures adopted included strengthening of co-operatives, nationalisation of scheduled commercial banks (SCBs), fixing targets for lending to agriculture, launching new schemes like service area approach, lead bank scheme, creation of Regional Rural Banks (RRBs) and apex national level bank, National Bank for Agriculture and Rural Development (NABARD), etc. (Dandekar and Wadia, 1989; Gadgil, 1992).

However, the institutional agricultural credit delivery system is faced with some problems which restrict its outreach to different states and sections of farming classes. The share of agricultural credit to total credit declined from 20.5 per cent to less than 10 per cent by March 2003 (Kumar, 2005). Moreover, NSSO Survey (2003) showed that, of the total cultivator households (89.35 million), the coverage by formal sector is only 27 per cent. In spite of the various measures to rejuvenate farm

*Central Potato Research Institute, Shimla – 171 001 (Himachal Pradesh) and †Central Potato Research Station, Patna, respectively.

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credit, the flow of credit to the agriculture sector remained quantitatively and qualitatively poor. Institutional sources meet only 51 per cent of the credit requirement of the farm sector (Rao, 2003). Besides, the extent of coverage by formal sources shows distinct bias towards households with larger farm holdings (Thorat, 2006). The small and marginal farmers, tenants and agricultural labourers still heavily depend upon informal source of finance to meet their credit needs and pay a very high interest rate. Moreover, the distribution of institutional credit on the basis of area was highly skewed. For example, the eastern region, an agriculturally less developed region, received only Rs.1092/ha of gross cropped area in 2001-02 which is the second lowest only after the north-eastern region of the country (Sidhu and Gill, 2006).

Potato is a capital intensive crop which needs huge inputs in limited time. Majority of the potato cultivators are small and marginal and hence, it is important to analyse what are the institutional and non-institutional sources of their financing. In the eastern region, potato is a major crop. This region also suffers from inadequate supply of institutional credit (Mohanty and Haque, 2003). Keeping these facts into account, in this study, efforts are made to critically analyse the credit avenues and associated constraints of potato growers of the eastern region. Bihar and West Bengal were purposively selected for the present study. These two states are the major potato producers in the region. While, Bihar is one of the poor yielders in the country (93 q/ha), West Bengal is among the highest yielders with 237 q/ha (Pandey *et al.*, 2007). The study examines the various sources of investment and their share in the total cost of cultivation, determinants of access to institutional loan and the major constraints in getting financial aid based on empirical evidence from the two states.

II

METHODOLOGY

The study is based on primary data collected from four districts of West Bengal (Jalpaiguri, Burdwan, Hooghly and Paschim Medinipur) and three districts in Bihar (Nalanada, Muzaffarpur and Patna). For the same, a total of 439 farm-families spread over 115 villages in the seven districts were surveyed. The survey included 3 blocks from each district and a minimum of three villages from each block. The reference period for the study was January-February 2007. Data were tabulated and analysed using simple statistical tools like mean, percentage etc.

In order to measure the effect of the demographic and economic variables on the access to institutional loan, a logit model has been fitted. Data collected involved information on the sources of loan and demographic and economic variables of the farmer, viz., education, age, operational holding, off-farm income, family size, etc. The model specifies a binary response function in which the dependent variable is a dummy variable being dichotomous in nature. The dependent variable assumes a value 1 for institutional loan availers and 0 for non-institutional loan availers. The

probability of availing loan is expressed in terms of logistic distribution. Then the logit is defined as the natural logarithm of the ratio of the probability of institutional loan availing (p_i) to non-institutional availing of loan which is called as log odds ratio. The logit is then regressed on the variables related to the farmer mentioned above. A dummy variable for state (1 for Bihar and 0 for West Bengal) was also included in order to quantify the difference between the two states in institutional loan availing. The logit model used is of the form:

$$\ln\left(\frac{p_i}{(1-p_i)}\right) = b_1X_{1i} + b_2X_{2i} + \ldots + b_{ki}X_{ki} + e_i$$

Here, X_k is the k-th independent variable. e_i is the random error assumed to follow normal distribution with constant and homoscedastic variance matrix. Estimations of the coefficients were carried out using MLE method available in LIMDEP software package.

III

RESULTS AND DISCUSSION

Cost of Cultivation and Share of Credit

Potato is a capital-intensive crop. Table 1 reveals that one hectare of its cultivation requires about Rs. 57,000 in Bihar and Rs. 65,000 in West Bengal. All the

TABLE 1. COST OF CULTIVATION AND SHARE OF CREDIT IN TOTAL INVESTMENT

State/ district (1)	Value/ (per cent) (2)	Cost of cultivation (Rs./ha)							Share of loan in total investment (per cent) (10)
		Seed+ ST** (3)	Fertiliser (4)	Plant protection (5)	Irrigation (6)	Human labour (7)	Others† (8)	Total cost (9)	
Bihar	Value	18274	9898	1351	2982	9956	14216	56678	20.47
	per cent*	32.24	17.46	2.38	5.26	17.57	25.08	100.00	
Nalanda	Value	24468	9194	1221	2601	9952	14566	62001	20.33
	per cent*	39.46	14.83	1.97	4.20	16.05	23.49	100.00	
Muzaffarpur	Value	13922	12574	1266	2714	9347	14600	54425	19.05
	per cent*	25.58	23.10	2.33	4.99	17.17	26.83	100.00	
Patna	Value	16473	7854	1569	3646	10588	13465	53595	22.08
	per cent*	30.74	14.65	2.93	6.80	19.76	25.12	100.00	
West Bengal	Value	18863	14084	1690	4236	11323	15288	65482	28.38
	per cent*	28.81	21.51	2.58	6.47	17.29	23.35	100.00	
Jalpaiguri	Value	17952	13588	3505	2600	12446	14716	64806	21.02
	per cent*	27.70	20.97	5.41	4.01	19.20	22.71	100.00	
Burdwan	Value	20598	14173	1144	4643	10994	16455	68007	26.34
	per cent*	30.29	20.84	1.68	6.83	16.17	24.20	100.00	
Hooghly	Value	19835	13205	1193	3522	10522	15096	63373	30.17
	per cent*	31.30	20.84	1.88	5.56	16.60	23.82	100.00	
P. Medinipur	Value	17047	15391	954	6047	11370	14899	65708	35.77
	per cent*	25.94	23.42	1.45	9.20	17.30	22.67	100.00	

*Percentage to the total cost, **Seed treatment, †Includes cost of land preparation, land rent and land revenue.

cost components are higher in West Bengal as compared to Bihar. Among them fertiliser, plant protection and irrigation are significant. However, in both the cases, seed is the single largest item of cost, which shared about 30 per cent of total cost. The West Bengal potato farmers mainly rely on Punjab for seed and during 2005-06 it was very expensive. A substantial amount of seed comes from Bhutan to North Bengal, especially to Jalpaiguri district. The quality of Bhutan seed is not assured and disease-pest infestation is not ruled out. A lot of farmers from Bihar bring seed from West Bengal named 'Bengal Jyoti' and hence, the average seed price in Bihar was lower (Rs.737/quintal) and in West Bengal the seed was too costly (Rs. 1469/ quintal). However, due to the difference in seed rate, the seed cost does not differ much. Since the degree of mechanisation in potato cultivation is low, the share of human labour is substantial being more than 17 per cent in both the states. Land preparation and fertilisers were the other major cost items.

Very often the potato farmers cannot manage this large amount of money from their own sources and they take credit, in cash and kind, from a number of sources. The table indicates that around 20 per cent of total investment in Bihar potato cultivation comes from credits and the rest they arrange from their own sources. In comparison to Bihar, West Bengal farmers manage to receive more loans which is more than 28 per cent, but still about 26 per cent potato farmers receive loan from non-institutional sources. Across different districts, in Bihar it is almost the same but in West Bengal, Jalpaiguri received the lowest and Paschim Medinipur received the highest credits. It is disheartening to see that the role of institutional sources, like banks, co-operatives and Self-Help Groups is insignificant in Bihar with only about 6 per cent of total investment of potato from institutional sources. It is much better in West Bengal, where institutional sources provide one-fifth of the total investment. In this regard, Hooghly and Paschim Medinipur are better off where more than 25 per cent money required for potato cultivation is provided by institutional sources.

Sources of Investment

Table 2 provides a vivid picture of the sources of loan. It reveals that in Bihar only about 15 per cent farmers went for institutional loan, whereas it is more than 34 per cent in case of non-institutional loan. To put it differently, in the case of farmers who availed loans, about 29 per cent and 26 per cent of total investment comes from non-institutional and institutional sources, respectively. The gap is reduced here largely due to the fact that large farmers opt for institutional loans. Input traders, fellow farmers, money lenders were the important non-institutional sources in Bihar. In West Bengal they are money lenders, input and output (potato) traders. The findings of the present study are in conformation with the observation made by Thorat (1991) and *Agriculture Today* (Anonymous, 2007). These non-institutional credit suppliers charge exorbitant interest rates. The interest rate may even go upto 70 per cent. The potato traders gives cash loan in return of assurance from the farmers of

TABLE 2. CATEGORY-WISE SOURCES AND QUANTUM OF LOAN INVESTED IN POTATO CULTIVATION

(1)	(2)	Nalanda (3)	Muzaffarpur (4)	Patna (5)	Bihar (6)	Jalpaiguri (7)	Burdwan (8)	Hooghly (9)	Paschm Medinipur (10)	West Bengal (11)
Friends and relatives	Amount*	560	213	721	584	742	-	108	-	186
	per cent**	6.15	3.03	6.25	5.13	6.67	-	1.59	-	2.05
Fellow farmer	Amount	8681	1366	3109	4624	793	-	-	-	169
	per cent	24.62	6.06	15.63	15.38	5.00	-	-	-	1.23
Potato trader	Amount	2626	427	6219	4107	2175	2728	151	936	1419
	per cent	7.69	1.52	1.56	3.59	8.33	5.00	1.59	4.92	4.92
Input trader	Amount	2175	333	7889	4803	731	1065	2234	3298	1967
	per cent	13.85	1.52	6.25	7.18	5.00	6.67	9.52	18.03	9.84
Money lender	Amount	1313	2988	2667	2241	3839	3986	270	3655	2920
	per cent	7.69	4.55	10.94	7.69	8.33	13.33	3.17	14.75	9.84
Non-institutional loan	Amount	15355	5327	20606	16359	8281	7778	2763	7889	6661
	per cent	53.85	13.64	35.94	34.36	30.00	25.00	14.29	34.43	25.82
Bank	Amount	4390	33634	14552	13916	4172	9970	4415	15590	9046
	per cent	7.69	21.21	10.94	13.33	15.00	20.00	11.11	49.18	23.77
Co-operative	Amount	-	-	1368	702	4300	11823	13517	6114	8932
	per cent	-	-	4.69	1.54	13.33	28.33	60.32	27.87	32.79
SHG	Amount	-	-	-	-	307	-	-	-	65
	per cent	-	-	-	-	3.33	-	-	-	0.82
Institutional loan	Amount	4390	33634	15920	14618	8779	21794	17932	21705	18043
	per cent	7.69	21.21	15.63	14.87	31.67	48.33	69.84	70.49	55.33
Total	Amount	19745	38961	36526	30977	17059	29572	20695	29594	24704
	per cent	60.00	31.82	43.75	45.13	61.67	65.00	80.95	81.97	72.54

*Average (among the loan takers) loan (in Rs.) per farmer invested in potato cultivation per ha. ** Percentage of total farmers who availed the loan.

selling the produce at lower market price. Input traders give fertilisers and chemicals on credit. In some cases, apparently no interest is charged but the price of inputs is considerably higher. However, hassle-free, familiarity, unlimited amount, low transaction cost, easy and timely availability make them attractive to the potato farmers.

India has the largest co-operative network in the world (Uberoi, 1996) and it continues to account for the largest share of institutional credit in India. The co-operatives have been built up in India to help the poorer sections of the community providing a stronger financial base. The present study shows that co-operative societies have very strong presence in West Bengal, particularly in Burdwan and Hooghly districts. In Hooghly, as high as 60 per cent of potato farmers get loan from co-operative societies. In some cases they also arrange for seed, fertilisers, etc., in credit. In Burdwan and Paschim Medinipur around 28 per cent farmers got help from co-operative societies. In Paschim Medinipur, it is a bank which alone disburses about 24 per cent of total investment.

In Jalpaiguri district, some farmers formed Self-Help Groups (SHG). The members deposit money, disburse loans among the needy members and get dividends. Self-Help Groups act as a 'doorstep' bank and have been recognised by the policy makers as the effective conduits for accomplishing the distributional objectives of monetary policy. The SHG-bank linkage programme has emerged as the largest micro credit programme in the world. The programme has made rapid progress since its inception in 1992. Hence the formation of more such SHGs needs to be encouraged everywhere. Now-a-days with education and increasing awareness more and more people want to avail the institutional loans. In-built insurance mechanism in the loan also found favour with the farmers. However, in Bihar still co-operative efforts in potato cultivation is almost non-existent and total institutional loan is also not impressive. Only in Muzaffarpur district a significant number (21.21 per cent) of farmers could avail institutional loan. Even a lot of farmers did not have proper knowledge on the bank procedures and they do not get the crop insurance with the loan. Hence, banks and co-operatives should penetrate more among the farmers to free them from the clutches of moneylenders, input and output traders.

Determinants of Institutional Loan

Among the loan availers, in the present study, only 32.22 per cent in Bihar and 76.21 per cent in West Bengal got the institutional loan. Here an attempt is made to capture the effect of various economic and demographic variables in accessing the institutional credits. The logit model was fitted taking operational holding, age and education of the family head, family size, availability of off-farm income and state as independent variables and institutional loan taken (yes or no) as dependent variable. The results are presented in Table 3.

TABLE 3. LOGIT MODEL ESTIMATES FOR AVAILING INSTITUTIONAL LOAN

Variable (1)	Coefficient (2)	SE (3)
Operational holding	0.337**	0.148
Age	-0.003*	0.0018
Education	0.092***	0.029
Family size	0.034*	0.019
Off farm income	-0.114*	0.065
State	-2.197***	0.318

*, **, *** indicate level of significance at 10, 5 and 1 per cent, respectively.

The coefficients estimated indicate the effect of one unit change in corresponding variable on the log odds ratio of availing institutional loan. A perusal of Table 3 reveals that as the education and family size increase, the probability of availing loan also increases. The estimate of education is highly significant indicating that complex formalities and lack of information keeps away the less educated farmers from the formal sources of credit. A number of farmers reported lack of knowledge regarding bank procedures and they are also afraid of 'defaulter' tagging. Negative coefficients indicate the increasing probability of institutional loan availing for decrease in off-farm income and operational holding. Those who are having off-farm income generally do not need to go for any loan. If at all needed, they manage from their friends and relatives. The study proved that institutional credit has been more concentrated on the cultivators with higher land holdings. Sidhu and Gill (2006) also found that the number of small borrowers accounts in case of SCBs has come down over time indicating shifting of their focus to large farmers. Further, Kumari (2005) also reported that in Andhra Pradesh accessibility to institutional credits increases with the increase in farm size. The poorer section of the rural population continue to borrow largely from private agencies like moneylenders, traders and relatives, as co-operatives and commercial banks mainly cater to the needs of the better-off (Mohanty and Haque, 2003). The value of -2.197 shows the decrease in log odds ratio of loan availed in Bihar as compared to West Bengal. This finding conforms to the results of Table 2.

CONSTRAINTS IN GETTING CREDITS

The potato farmers in both the states face a lot of problems in availing credit. Some farmers do not go for institutional loan due to lack of knowledge regarding bank procedures and formalities. About 16 and 14 per cent of the potato farmers in Bihar and West Bengal, respectively quoted this problem. Hence, the result clearly emphasises the need of simplifying the formalities of institutional loans and thus making it easily accessible to even the illiterates. Further, the farmers are also afraid of being a defaulter (11.28 and 8.61 per cent). In case of crop failure, they may face a lot of hardships in repaying the loan. Moreover, once the defaulter bank or co-operative societies do not disburse credit until the previous loan is repaid. Among the

institutional loan availers, delay in disbursement is the most problematic, much to the benefit of private moneylenders. In a number of cases the loan is not available on time when farmers need it badly, thanks to the complicated formalities and laxity on the part of officials. In potato cultivation, farmers have to invest more than half of the total investment in the initial period, i.e., during planting time. Hence, for effective utilisation, the credit should be made available at the right time. Moreover, insufficient amount again discourages farmers going for institutional credit. Keeping in view the increasing cost of inputs, the loan amount should be sufficient to purchase the inputs in optimum quantities. In this regard, introduction of Kisan Credit Card (KCC) during 1998-99 is a welcome development. KCC has helped in reducing transaction cost by providing access to all types of short-term credit. The farmers should be made aware of this scheme fully so that no misunderstanding remains.

TABLE 4. MAJOR CONSTRAINTS FACED BY FARMERS IN AVAILING CREDIT

(*per cent*)

Constraints	Nalanda	Muzafar-pur	Patna	Bihar	Jalpaiguri	Burdwan	Hooghly	Paschim Medinipur	West Bengal
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Institutional credit									
1. Delay in disbursement	16.92	21.21	14.06	17.44	18.33	11.67	7.94	9.84	11.89
2. Complicated formalities	20.00	13.64	14.06	15.90	10.00	13.33	12.70	18.03	13.52
3. Insufficient amount	1.54	3.03	9.38	4.62	18.33	11.67	12.70	14.75	14.34
4. Risk of being defaulter	6.15	18.18	9.38	11.28	11.67	11.67	7.94	3.28	8.61
5. Lack of insurance	7.69	9.09	14.06	10.26	-	-	-	-	-
6. Lack of knowledge	9.23	6.06	12.50	9.23	10.00	6.67	4.76	4.92	6.56
7. Lack of individual insurance claim	-	-	-	-	5.00	5.00	11.11	13.11	8.61
8. Lack of guaranteer	1.54	-	7.81	3.08	8.33	3.33	3.17	3.28	4.51
9. Neglected being poor	13.85	6.06	7.81	9.23	-	-	-	-	-
10. Corruption	7.69	9.09	1.56	6.15	-	-	-	1.64	0.41
11. Official harassment	1.54	1.52	1.56	1.54	1.67	5.00	1.59	3.28	2.87
12. Does not give to the defaulters	-	-	3.13	1.03	3.33	1.67	1.59	4.92	2.87
Non-institutional credit									
13. High interest rate for non-institutional loans	9.23	3.03	1.56	4.62	11.67	6.67	3.17	3.28	6.15
Nil	15.38	30.30	26.56	24.10	31.67	35.00	41.27	26.23	33.61

The comprehensive National Agriculture Insurance Scheme (NAIS) is in operation since 1999-2000. However, the coverage is still very poor. The potato farmers in Bihar expressed displeasure that the bank does not provide insurance even if they could manage the loan. But in West Bengal, this does not pose a problem and the farmers are insuring their potato crop. In fact, the insurance premium is ingrained in the loan itself and hence it is compulsory in the bank and co-operative loans. Private participation in the agriculture insurance sector needs to be encouraged. However, the West Bengal potato farmers are facing problems in claiming insurance money. Firstly, it is available after a long gap and secondly, the claim is not available in the case of loss for an individual farmer. Currently, the claim is based on the assessment at *Gram Panchayat* level. In case, few farmers in a *Gram Panchayat* suffer losses, they would not be able to get the claim.

The share croppers/tenant farmers generally do not get the bank credit for want of securities. This problem is also reported by Kumar (2005). In potato cultivation a substantial number of farmers takes land on rent and they are unable to get the institutional loan as they do not possess the land records. Moreover, some Bihar farmers think they are neglected by the bank because they are poor. Corruption and harassment is also reported. In Bihar, a few farmers complained that they have to give some commission before the loan is being disbursed. Though there are some advantages in non-institutional loans like, timely and hassle-free availability, unlimited quantity etc., a major difficulty lies with its excessive interest rate. In some cases, it may even go upto 70 per cent.

IV

CONCLUSIONS AND SUGGESTIONS

In sum, the foregoing analysis shows that potato cultivation requires a huge amount of investment. The farmers of Bihar and West Bengal acquire 20.47 and 28.37 per cent of this amount from a number of sources. Though in West Bengal a significant number of farmers managed to acquire the institutional loan, in Bihar it is handful. More than one-third of Bihar potato farmers rely on non-institutional sources like fellow farmers, moneylenders and input traders, etc. Though the non-institutional loans are costly certain advantages like easy and hassle-free availability, familiarity, unlimited amount, timely availability and lack of other avenues attract farmers towards them. Logit model regression shows that young age, large operational holding, higher education and absence of off-farm income are the conducive factors for accessing institutional loan. Further, potato farmers in West Bengal tend to go more for institutional sources of loan. A number of constraints in availing institutional and non-institutional loans have been identified.

It was found that still a lot of potato farmers are outside the ambit of formal sources of credit. Hence the study suggests that banks and co-operatives should come forward to rescue the potato farmers. The over-dependence on non-institutional

sources should be arrested by all the formal sources of credit by expanding its outreach to the corner most villages. Banks should revise the existing scale of finance taking into consideration the increased cost of inputs to help the farmers to use optimal levels of inputs and increase productivity of crops. The co-operative societies should be strengthened particularly in Bihar. More SHGs needs to be formed. Mechanisms need to be in place to recover the overdues resulting from willful default. Banks and co-operatives can also render counselling to the distressed farmers, which could sort out many of their difficulties.

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