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Extent, Magnitude and Determinants of Indebtedness Among Farmers in Eastern India: A Survey-Based Study

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ABSTRACT

The study examines the extent and magnitude of indebtedness in farm households of rural Bihar in Eastern India, and uses the Tobit model to identify the determinants of indebtedness. Based mainly on primary data from the three agro-climatic zones in Bihar, the study covers 528 farming households in 40 villages across four districts. Credit is one of the critical inputs for agriculture development, but the study finds that the access of poor rural farmers and the weaker sections of society to institutional credit agencies remains to be limited, and that they continue to seek credit from moneylenders and non-institutional agencies, at usurious rates.

Keywords: Agriculture, Indebtedness, Bihar, Credit, Eastern India

JEL: Q10, Q12, Q14.

I

INTRODUCTION

Rising production cost and commercialisation have made agriculture high-cost and risk-sensitive to crop failure. Falling income due to poor returns from cultivation and absence of non-farm opportunities are indicative of the larger socio-economic malaise in rural India. This is accentuated by the multiple risks farmers face-yield, price, input, technology and credit, among others (Mishra, 2008). A *Situation Assessment Survey of Income, Expenditure and Productive Assets of Farmer Households* conducted by the National Sample Survey Organisation 2003 showed that 96.2 per cent of the farmer households surveyed, owning less than 4 hectares of land, had incurred monthly consumption expenditure in excess of their average monthly income from all the sources. Only the top 3.8 per cent of the farmer households earned enough to meet their monthly consumption expenditure; the rest were in a deficit (Government of India, 2005). In the absence of enough income for survival; a farmer avails loan mainly for their basic needs and investment in agriculture.

High consumption standards and inflated aspirations, demonstrated by ostentatious expenditure on celebrations, have been increasing the debt of various sections of peasants (Sidhu and Gill, 2006). Rural credit is assuming a pivotal role in accelerating agricultural development in India. Along with other inputs, credit is essential for establishing sustainable and farming systems. The availability of timely

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and adequate credit helps farmers by reducing transaction costs, particularly when input-related expenditure is rising, and gives them the capital to undertake new investments and/or adopt new technologies. The importance of agricultural credit is reinforced by the unique role of Indian agriculture in the macroeconomic framework along with its significant role in poverty alleviation (Kumar *et al*., 2010).

The role of financial institutions is crucial for the development of any sector; agriculture is no exception (Sidhu and Gill, 2006). The burden of indebtedness in rural India is immense, and falls mainly on the households of rural working people. The exploitation of this group in the credit market is one of the most pervasive and persistent features of rural life in India, and continues despite major structural changes in credit institutions and forms of rural credit in the post-Independence period (Ramachandran and Swaminathan, 2001).The concern over farmers' indebtedness and plight dates back as many as nine decades; in 1925, M.L. Darling said that "the Indian peasant is born in debt, lives in debt and dies in debt". Agrarian distress has led many farmers in Indian states to commit suicide, and such suicides are reported regularly (Reddy, 1998; Assadi, 1998; Deshpande, 2002; Gill, 2005; Satish, 2006; Singh, 2006; Singh *et al*., 2008; Bharti, 2011; Sainath, 2013).

Farmers, especially smaller ones, had been so adversely affected by neoliberal economic policies during the 1990s that some over-extended themselves financially. Not only had their agricultural income declined, cost of cultivation had increased. They were experiencing the increasing trend towards individualisation (Mohanty, 2005). Among Indian states, Bihar ranks as the second-most-impoverished. Stagnation of technology and traditional method of mechanisation in agriculture, low yields are sure way of economic backwardness in the state. Rural farmers have been distressed mainly by successive droughts and floods, illness, unexpected large expenses to meet social obligations and market collapse.

Before 2015, there was no history of farmer suicide in Bihar.[1] Even report of one suicide is a matter of great concern. When all their sources of income prove insufficient, small farmers seek credit from moneylenders, because they cannot meet rigid bank loan criteria about season, cropping pattern or scale of finance (Kumar and Sarkar, 2012). But moneylenders charge usurious rates; therefore, policymakers have been making efforts to reduce farmer dependence on informal sector finance. Against this backdrop, this paper discusses the extent, magnitude and determinants of indebtedness in farming households in rural areas of Bihar, a state in eastern India.

The paper is organised into four sections. Section I introduces the study. Section II presents the methodological approach of the study and its sampling design and analytical analysis. Section III presents the results and discussion. Section IV presents the concluding remarks.

II

METHODOLOGY

2.1 *Selection of Sample and Data Collection*

The state of Bihar, in the eastern part of India, has three well defined agro-climatic zones: North-West Alluvial Plains (Zone-I), South Bihar Alluvial Plains (Zone-II) and East Alluvial Plains. The East Alluvial Plains are divided into two sub-Zones: Eastern Sub-Zone (Zone-III (A)) and Western Sub-Zone (Zone-III (B)). Keeping in view the differences in agro-climatic conditions, one district from each zone has been randomly selected. The selected districts are Sheohar from Zone-I, Purnia from Zone-II, Lakhisarai from Zone-III (A) and Bhojpur from Zone-III (B). At the next stage, every block of each selected district has been chosen, and one village has been selected randomly from each block. A Primary Rural Appraisal survey was conducted in each village; during this survey, we identified the number of farmers from each category with the help of the head of the villages (Mukhia and Sarpanch) and well-informed people of the village to select the households. The set of each farm-size category has been taken as the average on the basis of information provided by head of the villages and well-informed people. Then from each selected village, 5 per cent of farm households were selected randomly from each farm-size category. Thus, the total sample consists of four districts, 40 blocks, 40 villages and 528 farm households. Of all the farm households surveyed, 78 were landless, 257 were marginal (up to 2.49 acre), 119 were small (2.50-4.99 acre), 52 were medium (5-9.99 acre) and 22 (more than 10 acre) were large farmers. The details on households, cropping pattern, yield and income from farming and other sources were collected through the field survey during October 2011 to February 2012, the reference year being 2010-11.

Analytical Approach

2.2 *The Tobit Model*

To study the quantum of indebtedness at the household level, any limited variable model can be employed (Madala, 1983). This is a specific issue, as the usual linear regression model is inadequate to deal with such situations. As half the households do not have any kind of outstanding debt, the value of dependent variable is zero. To estimate the regression for indebtedness, we have to drop such non-indebted households and estimate the model using only those households that have some outstanding debt. This leads to the serious problem of limiting the sample size and, hence, leading to non-randomness in the remaining sample of households, which creates some serious economic problems (Madala, 1983). However, the Tobit model is a limited dependent variable model that resolves this problem. Therefore, we used

a regression model to study the factors of indebtedness. A brief discussion of the Tobit model follows.

$Y_i = \beta^1 X_i + U_i$ RHS>0

$Y_i = 0$ otherwise

where, Y_i an indebtedness vector of n households; X_i is a matrix of indebtedness variables; β is a vector of k unknown parameters; U_i are residuals of independently and identically normally distributed with mean zero and constant variance σ^2.

For the above model, let N_1 be the sub-set of sample observations for which $Y_i = \beta^1 X_i + U_i$ occur first with $Y_i > 0$, N_0 be the sub-set of latter observations for which $Y_i = 0$. The distribution function (F_i) and density function (f_i) of the standard normal variate evaluated at $\beta^1 X_i/\sigma$ are:

$$F_i = F_i(\beta, \chi_i, \sigma^2) = \int_{-\infty}^{\beta\chi_i} \frac{1}{\sigma(2\pi)^{1/2}} e^{(-1/2\sigma^2)dt}$$

$$f_i = f_i(\beta, \chi_i, \sigma^2) = \frac{1}{\sigma(2\pi)^{1/2}} e^{(-t/2\sigma^2)dt}$$

The log likelihood function is:

$$\log L = \sum_0 \log(1 - F_i) + \sum \frac{1}{(2\pi\sigma^2)^{1/2}} - \sum \frac{1}{2\sigma^2}(Y_i - \beta\chi_i)^2$$

where, the first term on the right hand side is for the observations for which $Y_i = 0$ and second and third terms are for the observations for which $Y_i > 0$. The model can estimate by maximum likelihood estimation procedure following Newton-Rophson or any other iteration method (for details, Please see Madala, 1983).

The determinant of the extent and magnitude of indebtedness is co-determined by both household-level attributes as well as by macro-level characteristics associated with broader geographical and economic dimensions of the villages/regions where a household operates. Some of these are tangible, and others non-tangible. Variables taken as determinants of indebtedness were identified during the field study.

III

RESULTS AND DISCUSSION

3.1 *Extent of Debt in Rural Areas*

Around half the farming households in rural areas in the state are under debt (Table 1). However, there are considerable variations across farm-size categories. The percentage for indebted households for the landless and marginal farm-size

categories are 83.33 and 48.64, while in the case of large, small and medium farm-size categories these percentages are 40.91, 40.34 and 30.77 respectively.

TABLE 1. EXTENT OF INDEBTEDNESS AMONG FARMERS BY CATEGORY

Farm-size categories (1)	No. of indebted households (2)	No. of sampled households (3)	Percentage of indebted households (4)	Average amount of outstanding debt (Rs.) Per indebted household (5)	Per sampled household (6)	Total debt per owned acre (7)	Total debt per operated acre (8)
Landless farmers	65	78	83.33	13,338	11,115	0	6,828
Marginal farmers	125	257	48.64	20,080	9,767	15,568	9,864
Small farmers	48	119	40.34	42,854	17,286	10,876	11,599
Medium farmers	16	52	30.77	46,000	14,154	6,723	9,445
Large farmers	9	22	40.91	43,889	17,955	2,315	3,484
All sampled farmers	263	528	49.81	24,962	12,434	9,872	9,186

Source: Field survey.

The average amount of loan per indebted farming household is Rs. 24,962 in rural areas, while the average amount of loan per sampled household is Rs. 12,434. It is interesting to note that the amount of loan per indebted household and per sampled household increases as farm-size goes up, except for the medium farm-size category. This reveals that farmer needs increases with the increase in land size because the major share of income cannot be generated without investing in operational as well as fixed costs. Further, the table reveals that for an average farming household, the amount of loan per owned acre and per operating acre is Rs. 9,872 and Rs. 9,186 respectively. It indicates that the burden of debt per acre is greater on lower farm-size categories than on the large farm-size category. The large farm-size category partly finances its crop production operations from its own savings.

3.2 *Sources of Credit for Indebtedness*

In the rural credit market in India, institutional lenders readily extend large farmers formal credit, as they can be trusted on the basis of their capacity to pay, but the access of poor marginal and small farmers to institutional credit is quite limited (Rao, 1980; Basu, 1983; Swain, 1986; Sarap, 1991; Jodhka, 1995). At the state level, around 64 per cent of credit is supplied to indebted households from institutional sources and the rest from non-institutional sources (Table 2). This proportional share is inversely associated with farm-size. The major source of credit of large land holders is institutional sources. While, small land holders still depended on non-institutional sources (mainly on large farmers or landlords) in the study regions. The medium and large farm households borrow large amounts from institutional sources because their asset position is better, whereas landless, marginal and small farm households, which have fewer assets, depend mainly on non-institutional sources. They need small amounts of credit during cropping and harvesting as well as for household consumption. Because the credit available is insufficient, farmers borrow

from moneylenders at exorbitant rates of interest, and have little farm produce left over for family consumption after repaying their loans.

TABLE 2. SOURCE WISE PER CENT DISTRIBUTION OF THE AMOUNT BORROWED BY DIFFERENT CATEGORIES OF FARMERS

S.No. (1)	Source of debt (2)	Landless farmers (3)	Marginal farmers (4)	Small farmers (5)	Medium farmers (6)	Large farmers (7)	All sampled farmers (8)
I.	Non-institutional agencies						
1.	Large farmers or landlords	71.97	21.83	0.68	0.00	0.00	18.07
2.	Agricultural/professional money-lenders	8.42	9.32	6.32	0.00	0.00	6.66
3.	Traders	4.61	5.14	3.89	10.87	2.53	5.01
4.	Relatives and friends	1.38	9.92	7.54	0.00	0.00	6.49
5.	Others	0.69	0.32	0.00	0.00	0.00	0.21
	Sub-total	87.08	46.53	18.42	10.87	2.53	36.44
II.	Institutional agencies						
1.	Government	4.04	4.78	12.25	0.00	2.53	6.35
2.	Cooperative societies	1.15	1.00	0.00	0.00	0.00	0.53
3.	Commercial banks	7.73	47.69	69.32	89.13	94.94	56.68
	Sub-total	12.92	53.47	81.58	89.13	97.47	63.56
	Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Field survey.

Among institutional sources of credit to farmers, commercial banks play a major role (56.68 per cent of total credit) and it is positively associated with farm-size category. The large farm-size category avail most of their loans from this source. The traditional sources of credit (non-institutional source) are widely prevalent in the state, and the incidence is particularly high among landless and marginal farmers who are generally unable to repay their debts. It was also observed during the field survey that no landless farmer could take a loan from a commercial bank or co-operative, although government programmes make subsidised loans available for the upliftment of the poorest of the poor. Consequently, when in need, the rural poor borrow from private moneylenders who in most cases are their employers, lessors or shopkeepers. The field survey further brought out the fact that this often leads to debt bondage due to their current consumption, extravagant social expenditure and health problems. Reliance on non-institutional sources of credit was found to be much higher in the case of small farm-size farmers. As these farmers cannot provide collateral (such as land, jewellery, house), formal credit agencies do not extend them credit (Swain, 2001; Swain and Swain, 2007), and big land-owners end up as beneficiaries.

Agricultural/professional moneylenders are another important source of loans for an average farming household constituting 6.66 per cent of total loans, of which relatives and friends account for 6.49 per cent of total loans. This proportionate share is the highest for the marginal farm-size category followed by the small and landless farm-size categories. These farming households take loans during periods of distress because access is easy and availability is on demand, although average value of loan from these sources may be smaller. The share of government in advancing loans is

only 6.35 per cent for an average farming household, and less than 1 per cent of total loans have been taken from co-operative societies. This shows that the co-operative credit structure is weak in all the sampled districts in the state, and that the benefits of institutional credit are not reaching the landless, marginal and small farmers to the required extent.

Access to credit from commercial banks is limited and suffers from a number of problems. The majority of the farmers realised that the process for obtaining a bank loan was cumbersome and lengthy and that bank officials were unco-operative. Further, it is often observed that a landowner extends credit to his tenant, hires labour against loan advances and buys crops at a pre-determined lower price as stipulated in fertiliser or seed advance extended. The consequences of such interlinked transactions are interpreted differently by different economists.

3.3 *Purpose of Loan*

From a detailed distribution of the average amount of debt utilised for different purposes (Table 3), it may be observed that the usage of loan for income generation is quite high, i.e., 69.43 per cent of all the income generating activities. This proportion increases with increase in farm-size. However, 30.57 per cent of loans are used for non-productive purposes. Thus, an inverse relationship is found between these two. The highest proportion of the loan (42.88 per cent)is used for farm inventory purposes, followed by farm inputs (23 per cent) purchase of consumer goods (9.26 per cent), expenditure on health (4.66 per cent), and purchase of durable goods (about 4.27 per cent) by the sampled farm households.

TABLE 3. PURPOSE WISE PER CENT DISTRIBUTION OF AMOUNT BORROWED BY DIFFERENT CATEGORIES OF FARMERS

S.No.	Purpose of debt	Landless farmers	Marginal farmers	Small farmers	Medium farmers	Large farmers	All sampled farmers
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
I.	Productive						
1.	Purchase of farm inventory	15.22	31.12	67.67	37.36	59.49	42.88
2.	Purchase of farm inputs	29.30	20.52	12.45	45.52	37.97	23.00
3.	Purchase of land	0.69	0.00	0.49	0.00	0.00	0.24
4.	Purchase animals	0.58	8.05	0.00	0.00	0.00	3.15
5.	Expenditure on education	0.00	0.00	0.00	0.00	2.53	0.15
	Sub-Total	45.79	59.68	80.60	82.88	100.00	69.43
II.	Non-productive						
1.	House construction & repairs	0.00	2.39	0.00	6.79	0.00	1.68
2.	Purchase of durable goods	2.54	2.87	5.35	10.33	0.00	4.27
3.	Purchase of consumer goods	25.03	13.63	2.38	0.00	0.00	9.26
4.	Expenditure on healthcare	8.77	7.17	2.43	0.00	0.00	4.66
5.	Expenditure on social and religious and ceremonies	17.88	8.96	9.24	0.00	0.00	8.68
6.	Others	0.00	5.30	0.00	0.00	0.00	2.03
	Sub-Total	54.21	40.32	19.40	17.12	0.00	30.57
	Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Field survey.

The landless category has taken the highest proportion of loans for non-productive purposes (54.21 per cent); expenditure incurred on social and religious ceremonies accounted for 17.88 per cent, purchase of consumer goods for family maintenance accounted for 25.03 per cent and healthcare accounted for 8.77 per cent.

Small farmers avail higher proportion of loans for unproductive purposes (such as marriages and other social and religious ceremonies, house construction). Also, annual consumption expenditure far exceeds their annual income (Pandey, 2016); they borrow frequently for consumption purposes, and fall into a debt trap. It has been revealed that those farmers in medium and large farm-size categories have sources of income other than agriculture, and have some saving for expenditure on social and religious ceremonies, and so used debt only for productive purposes. The total amount of loan taken by large farmers and around 83 per cent of the loan taken by medium farmers were used for productive purposes or income-generating activities. Large farmers availed a part of their loans for expenditure on education.

3.4 *Rate of Interest*

Table 4 represents the rate of interest at which loans have been borrowed by farmers in different farm-size categories; 54.49 per cent of loans were taken at interest rates between 0 and 10 per cent per annum. This proportion is the highest for the small farm-size category followed by medium, marginal, large and landless farm-size categories. Another substantial proportion of total loans, about 18 per cent, were taken at interest rates of 10-20 per cent; it is the highest for the large farm-size category. Recently, much literature on interlinkage has emerged, which propounds that a zero-interest loan does not imply an absence of usury, since there may be implicit interest charges in the form of a lower wage payment or in the purchase of crops at less than the ruling market price from the borrower.

TABLE 4. DISTRIBUTION OF THE AMOUNT BORROWED BY DIFFERENT CATEGORIES OF FARMERS ACCORDING TO RATE OF INTEREST

(*per cent*)

S.No.	Rate of Interest (per cent per annum)	Landless farmers	Marginal farmers	Small farmers	Medium farmers	Large farmers	All sampled farmers
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1.	Nil	7.27	1.75	0.49	6.79	0.00	2.54
2.	0-10	20.07	46.37	77.44	66.71	39.24	54.49
3.	10-20	23.76	17.69	8.26	22.42	58.23	18.51
4.	20-30	7.27	4.66	0.68	0.00	0.00	2.96
5.	30-40	13.73	3.35	9.24	0.00	2.53	6.14
6.	More than 40	27.91	26.18	3.89	4.08	0.00	15.37
	Total	100.00	100.00	100.00	100.00	100.00	100.00

Source: Field survey, 2011-2012.

This analysis further highlights that the percentage share of loans taken at an interest rate of more than 40 per cent is highest among the landless and marginal farm-size categories because they depended mostly on non-institutional sources. It

was found that the poor farmers paid higher interest on loans than the rich farmers. Generally, money-lenders charged interest at 4-5 per cent per month, or 48-60 per cent per year, but institutional credit interest rates were 7-10 per cent per annum. About 6 per cent of the total loans were availed at 30-40 per cent per annum. Loans from friends and relatives were mostly interest-free.

3.5 *Determinants of Indebtedness*

The earlier sections explored the nature, extent and magnitude of indebtedness among farmers in rural Bihar. This section focuses on identifying the household-level factors of indebtedness.

TABLE 5. DETERMINANTS OF HOUSEHOLD LEVEL INDEBTEDNESS: TOBIT REGRESSION

S. No.		Coefficient	Std. Error
(1)	(2)	(3)	(4)
1.	Age of household head (years)	129.178	131.512
2.	Household size (numbers)	-302.663	554.725
3.	SC cast (dummy)	5,220.105	4,397.479
4.	Gender of head (dummy)	5,825.951	4,647.381
5.	Education of head	-253.158**	329.315
6.	Workforce participation ratio	-112.608	91.761
7.	Subsidiary occupation (dummy)	-672.380	5,040.056
8.	Land owned	-2,174.155***	599.559
9.	Tractor (dummy)	29,155.05***	8,314.78
10.	Pump set (dummy)	-4549.458	3,492.693
11.	Number of milch animals	1,657.467	1,700.794
12.	Total income (Rs.)	0.135***	0.040
13.	Rate of interest	740.862***	90.083
14.	Unproductive purpose (dummy)	20,218.38***	3,632.709
15.	Dummy for credit institutional sources	61,885.65***	3,764.846
16.	Moneylenders (dummy)	10,440.99***	5,634.479
17.	Land productivity	-0.123	0.138
18.	Pucca road connectivity	6,784.744**	3,418.584
19.	Electricity facility	4,123.823	3,423.944
20.	Distance from nearest town	1,065.515***	267.596
21.	Flood (dummy)	-638.787	4,681.634
22.	Drought (dummy)	829.617	4,349.423
23.	Purnia district (dummy)	-15004**	5,688.851
24.	Lakhisarai district (dummy)	-16242.53**	6,060.867
25.	Bhojpur district (dummy)	-17476.49**	5,556.735
	Const	-38082.4**	12,167.14
Diagnostic tests			
Loglikelihood -3096.182			
LR Chi-square(25) 451.40			
Pseudo R2 0.0679			
No. of Observations 528			

Source: Estimated from the Field survey.

Note: *, ** and *** indicate that the values are significant at 10, 5 and 1 per cent level respectively.

The results of the Tobit regression model of the determinants of quantum of outstanding debt are presented in Table 5. Contrary to our expectations, none of the

coefficients of household demographic factors turned out to be statistically significant. This suggests that, other things being the same, the extent of indebtedness among farmers in rural areas is not significantly impacted by the age of household head, household size, and caste dummy for Scheduled Caste households and the gender of dummy of households. Among other variables like education of head, workforce participation ratio and subsidiary occupation, only the coefficient of household head's education turned to be statistically significant with negative sign, which shows that the quantum of indebtedness is likely to decline as the household head's education level increases.

The quantum of indebtedness is inversely related with land ownership, as the estimated coefficient of landowner variable turned out to be statistically significant. It indicates that, on an average, one additional acre of land owned is likely to reduce the quantum of indebtedness by Rs. 2,174.15. This finding is supported by Singh and Toor (2005), who found an inverse relationship between extent of indebtedness and farm-size, and suggests that the problem of indebtedness is more serious among the landless, marginal and small farmers in rural Bihar than among medium and large farmers, other things being the same. However, land ownership and the estimated coefficient of tractor dummy bear a positive sign and are statistically significant. In fact, tractor ownership has a very complex relationship with outstanding debt. This is mainly because few farmers can afford a tractor, which costs of Rs. 4-5 lakhs. The estimated coefficient of total income of households bears a positive sign and is statistically significant. In other words, quantum of indebtedness is more among rich farmers than among the poor. This supports Darling's hypothesis: indebtedness and propensity go together.

Interestingly, all the variables related to access and utilisation of credit turned out to be statistically significant. The rate of interest bears a positive sign, and is found to be statistically significant. Its estimated coefficient suggests that, on average, an increase in interest rate by 1 percentage point increases farmer indebtedness by Rs. 740.86. Similarly, borrowing for unproductive purposes worsens the problem of indebtedness—on average, households who borrow for unproductive purposes are deeper in debt by Rs. 20,218.38 more than households who do not. This supports our expectation, and general perception, that unproductive loans push rural households into indebtedness and a debt trap. The coefficient of dummy for institutional credit bears a positive sign, and is found to be statistically significant. This finding is contrary to that in the study by Narayanamoorthy and Kalamkar (2005), which finds an inverse relationship between these two. This difference may be because their study is national-level whereas our study is only for one state, Bihar.

The coefficient of land productivity variable turned out to be statistically insignificant. This implies that the land productivity differential across farmers is not significantly related with indebtedness, probably because higher productivity leads to more returns on land, which has already been established in the income variable included in the model. The estimated coefficient of dummy for *pucca* road

connectivity of the village bears a positive sign, and is found to be statistically significant. This is contrary to our expectation that road connectivity facilitated the access of rural households to basic civic amenities (like quality health services and education, markets for agriculture input-output and other consumer durable and non-durable goods and services). However, estimated coefficient of distance variable of village from the nearby town as per expectation bears a positive. The estimated coefficient of nature i.e., neither flood nor drought dummy is statistically significant, probably because all the households under study were exposed to similar uncertain weather conditions, which led to non-significance in the included dummy in the model.

Interestingly, in all the three districts, the dummy bears a negative sign and is found to be statistically significant. This indicates that the quantum of indebtedness among households in Purnia, Lakhisarai and Bhojpur districts is substantially less than that among households located in Sheohar district. Even the value of estimated coefficient suggests that the quantum of indebtedness of an average farm household in Bhojpur district is less than that in Purnia and Lakhisarai districts.

IV

CONCLUSION

The study has made an attempt to investigate the nature, magnitude and determinates of indebtedness of different farm-size categories in the eastern India of state Bihar. The analysis demonstrates clearly that around 50 per cent of farm households in rural Bihar in the sample are in under debt; the percentage for indebted households is inversely related to farms-size; and that the percentage of indebted households decreases as holding size increases. The average amount of loan was Rs. 24,961.98 per indebted household but Rs. 12,433.71 per sample farm household. Notably, loan amount per indebted household increases as farm-size goes up, except for large farms. For an average sampled farm household, loan per owned acre is Rs. 9,872.29 and Rs. 9,186.36 per operating acre. The burden of debt per owned acre is the highest in case of marginal farms. Most farmers use loans for productive purposes; and these are positively related with farm-size. Consumption loans are less important than production loans. Most loans availed were levied interest at rates of 0-10 per cent per annum. Institutional agencies provide 63.56 per cent of the total debt; constituting the main source of credit; and are positively related with farm-size. Non-institutional agencies provide the rest of the total debt and are important sources of credit for small village landholders.

The Tobit regression model used to determine indebtedness suggests that the factors are several. The extent of indebtedness is higher among households with small landholdings, low education level of household head and possession of a tractor. The other, factors such as source and purpose of borrowing contribute significantly towards aggravating indebtedness. As expected, loans availed for non-productive

purposes contribute to indebtedness. The model confirms that propensity and indebtedness moves together.

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NOTE

1. http://indianexpress.com/article/india/india-others/bihar-paddy-link-to-3-farmer-suicides/.

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