



Agricultural Economy of Jharkhand

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Agriculture in Jharkhand depends largely on rainfall, 82% of which is received during four months from June to September. The State is a mono- cropped region. Farming activities are confined largely during the Kharif season from June to November-December. After kharif season, a very small portion of net sown area(17%) is brought under rabi crops. Jharkhand is a food deficit State to the extent of 52% in case of food grains. The purpose of present paper is to explain the nature and causes of agricultural backwardness in Jharkhand State.

Keywords : Jharkhand, Agriculture

Introduction

The State of Jharkhand was formed by carving out Chotanagpur and Santhal Pargana regions from Bihar on 14th Nov'2000. Before the formation of State, these regions remained backward due to neglect of public investment in agriculture and rural infrastructure and suffered from some sort of colonial exploitation by mainstream population of Bihar. However, it is a great tragedy that even nine years after its formation the economic conditions of people in the state have remained unchanged due to ill-governance, political instability and corruption and poor attention by government departments. The rural poverty ratio in this State in 2004-05 was the highest in the country (46.3%) next only to orissa (46.8%)¹. The State is known all over the world for its rich mineral resources, yet 78% of its total population of 26.9 million lives in rural areas, while 75% of its workforce depends on agriculture for their livelihood. The agricultural productivity is so low that this major sector in respect of employment contributes only 21% of State gross domestic product.

The farming of this state depends largely on rainfall, 82% of which is received during four months from June to September. The State is a mono- cropped region. Farming activities are confined largely during the Kharif season from June to November-December. After Kharif season, a very small portion of net sown area(17%) is brought under rabi crops. As agriculture is seasonal in character, the rural workforce gets seasonal employment. Most of them go without work after December and are forced to migrate to other States in search of jobs and are engaged in tea gardens, domestic services, brick- making etc. where they suffer from different kinds of exploitation. Jharkhand is a food deficit State to the extent of 52% in case of food grains. It produces about 21 lakh tonnes of foodgrains (2005-2006) against its requirement of 46 lakh tonnes of foodgrains to feed its 26.9 million population. The deficit is to the extent of 65% in case of fruits, 51% in case of milk and 34% in case of fish.²

The purpose of present paper is to explain the nature and causes of agricultural backwardness in Jharkhand State. It is divided into 4 sections. Section I discusses the geo-physical features of the State. Section II deals with the level of agricultural productivity as compared to the national average. Section III analyses the causes of low productivity and section IV provides suggestions for improving the condition of agriculture.

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Jharkhand has a geographical area of 79.72 lakh hectares, the major part of which is a plateau and hilly region. The land surface is undulating causing soil erosion on a rampant scale every year due to swift run-off of rainwater during monsoon season. About 23 lakh hectares (28.9% of the geographical area) is affected by severe soil erosion, while total area affected by moderate to severe soil erosion is 32 lakh hectares(40% of the geographical area)³. The soil cover over large part of the State is thin, acidic and less fertile with low water retention capacity.

Land Use Pattern

The land use pattern in the State for the year 2004-2005 is given in table 1.

Table 1

Distribution Of Agricultural Land By Types Of Use In 2004-2005

It may be seen from the table that 23.3 lakh hectares of area forming about 29.3% of total geographical area (g.a) of the State was under forest cover. The State has a cultivable area of 41.84 lakh hectares.

		Area	% of Total geographical area
1	Geographical Area	7972	100
2	Forest Area	2333	29.3
3	Not available for Cultivation	1366	17.1
4	Other Uncultivated land excluding fallow land	476	6.0
	a Permanent Pastures and grazing land	88	1.1
	b Land under miscellaneous free crops & groves not included in Net sown area	113	1.4
	c Cultivable waste Land	274	3.4
5	Fallow Land	2027	25.4
	a Fallow land other than Current Fallow	783	9.8
	b Current Fallow	1244	15.6
6	Net Sown Area	1763	22.1
7	Total cropped Area	2068	-----
8	Cropping Intensity	116.9	-----
9	Agricultural Land/Cultivable Land/Culturable Land	4184	52.5

Source : Govt. of India, Ministry of Agriculture, Department of Agriculture and Economic Co-operation, *Agricultural Statistics at a Glance, 2008*, Primary source, State Govt.

lakh hectares forming 52.5% of g.a. against the national average of 46.3%. However, the net sown area was just 17.65 lakh hectares, less than one-fourth (22.1%) of the g.a. A low portion of the net sown area in the State is accounted for by a large proportion of the land area remaining fallow (25.4% of g.a.) and cultivable Waste Land (3.4% of g.a). The total fallow land in the State was 20.3 lakh hectares more than the net sown area. Of the total fallow land, an area of 12.4 lakh hectares was current fallow, while remaining 7.8 lakh hectares was other than current fallow. Since a large area of land is less fertile and degraded due to soil erosion, the land once put to cultivation has to be given rest for 1 to 5 years to be brought again under cultivation. It may be mentioned that proportion of fallow land in the State is 3 times the national average of 8.4%.

Crop Pattern

The gross cropped area of the State marks a sharp fluctuation from year to year depending upon the conditions of the monsoon. It was 20.7 lakh hectares in 2005-2006, a year of normal rainfall, while it was 25.2 lakh hectares in 2006-07, a year receiving more than the normal rainfall. The cropping pattern for both 2005-06 and 2006-07 is shown in table 2.

Table 2

Area Under Different Crops (In Lakh Hectares)

Rice is the principal crop of the state. About 2/3 of the gross cropped area of the State is devoted to the cultivation of rice. Maize occupies about 9 to 9.5% of the cropped area. Coarse Cereals

Crop	2005-2006		2006-2007	
	Cropped Area	% to Gross Cropped Area	Cropped Area	% to Gross Cropped Area
Rice	13.5	65.2	16.2	64.3
Wheat	0.6	2.9	0.8	3.2
Maize	1.8	8.7	2.4	9.5
Coarse Cereals	2.2	10.6	2.9	11.5
Pulses	2.9	14.0	3.8	15.1
Foodgrains	19.2	92.8	23.7	94.0
Oilseeds	0.5	0.3	0.5	2.0
Fruits & Vegetables	1.0	4.8	1.0	4.0
Gross Cropped Area	20.7	100.0	25.2	100.0

Source : Govt. of India, Ministry of Agriculture, Department of Agriculture and Economic Co-operation, 'Agricultural Statistics at a Glance, 2008, Primary source, State Govt

altogether occupy 10.5 to 11.5 % and wheat about 3% of the cropped area. About 14 to 15% of the cropped area is under pulses. Altogether 93 to 94% of the gross cropped area of the State is put under food grain crops. The oilseeds and fruits & vegetables have a share of 2% and 4% in the gross

cropped area respectively.

Food Production

“The Agricultural Statistics at a Glance , 2008, a report of Ministry of Agriculture , Govt. of India shows an abrupt rise in food grains production in the State in the year 2006-2007 at 36.9 lakh tonnes over a production of 20.7 lakh tonnes in the previous year. As foodgrain production has never exceeded a level of 22 lakh tonnes in the State, this abrupt rise seems to be questionable and doubtful. Nevertheless, we present the figures of production for both 2005-06 and 2006-2007 in table 3.

Table 3

Production Of Different Foodgrains In Jharkhand (In Lakh Tonnes)

Source : Govt. of India, Ministry of Agriculture, Department of Agriculture and Economic Co-operation, 'Agricultural Statistics at a Glance, 2008, Primary source, State Govt.

II

Crops	2005-2006	2006-2007
Rice	15.6	29.7
Wheat	2.3	2.9
Maize	2.4	3.0
Pulses	1.7	2.6
Coarse Cereals	2.6	3.3
Pulses	1.7	2.6
Food grains	20.7	36.9

The productivity of crops in Jharkhand is lower compared to the national average and still much lower compared to that in some agriculturally progressive States like Punjab and Haryana. It may be seen from table 4 that the yield of food grains in Jharkhand in the year 2005-2006 was 1073 kgs per hectare against the national average of 1715 kgs per hectare. When we compare the productivity of food grains with that in Haryana (3393 Kgs/ha) and Punjab (4017 kgs/ha), it comes to about one-third and one-fourth respectively. In case of rice, the yield rate was 1150 kgs/hectare in Jharkhand, roughly one half of the national average (2102 kgs/ha). Same is true in case of yield of wheat, which is 1340 kgs/ha in Jharkhand compared to the national average of 2619kgs/ha. Barring a few crops, particularly pulses and Coarse cereals where yield levels in the State are at par with the national average, there exists a glaring gap between yield rate in Jharkhand and that in country as a whole and in agriculturally progressive States.

Table 4

Yield Of Different Crops (In Kgs/Ha) In the Year 2005-06

Crop	Jharkhand	All India	Punjab	Haryana
Rice	1150	2102	3863	3238
Wheat	1340	2619	4210	4232
Maize	1315	1938	3123	NA
Coarse Cereals	1165	1172	3033	1567
Pulses	592	598	NA	824
Food grains	1073	1715	4017	3393

Source: Govt. of India, Ministry of Agriculture, 'Agricultural Statistics at a Glance 2008', Department of Agriculture & Co-operation

III

There are various factors responsible for low agricultural productivity in the State, which may be analysed :

Low Proportion Of Irrigated Area

Lack of irrigation facility and dependence of agriculture mainly on rainfall is the main factor behind the low agricultural productivity in the State. Jharkhand has a net irrigated area of 16.4 lakh hectares which constitutes 9.3% of the net sown area against the national average of 40%. Again the larger proportion of irrigated area is served by the ponds and wells which provide an unreliable source of irrigation as they themselves depend on rainfall. In the years of deficit rainfall or in the case of delayed rainfall or drought conditions, the ponds remain dry and water level of well goes down. Table 4 provides source-wise irrigated area in Jharkhand.

Table 4
Source-wise Net Irrigated Area (In '000 Hectares) In 2003-2004

Various studies in India have shown that the yields are higher on irrigated land than on unirrigated land. A study by C. H. Hanumantha Rao ⁴ shows that yields of food grains on irrigated land was

Source	Net Area Irrigated	% to total
Canals	52.6	32.1
Tank	27.1	16.5
Tubewells	11.0	6.7
Other Wells	64.0	39.0
Total Wells	75.0	45.7
Others	9.3	5.7
Total	164.0	100.0

Source: Govt. of India, Ministry of Agriculture, Directorate of Economics & Statistics, Data on Source-wise and State-wise Net Area irrigated in India, 2003-2004.

two to six times higher than the yields on unirrigated land. A study by B.D Dhawan ⁵ revealed that

yields on irrigated land was twice as high as on the unirrigated land. The reason is that irrigation is accompanied by inputs like HYV seeds, fertilizer and pesticides which have a great potential of giving higher yields. The return from these inputs is risky when used in rainfed conditions. The HYV seeds and fertilizer can give higher yield when they are combined with controlled doses of water at critical stages of plants growth which is not possible when farming is done under rainfed conditions, as rainfall is often uncertain, untimely and deficient. Very often the rain fails at critical time such as in Adra Nakshatras when it is most needed to start the farming operations and in the Hathia Nakshatras when paddy crops are manuring. It may be mentioned that in Jharkhand only 44.4% of the paddy crop area is grown under HYV seeds as against the national average of 88.6%. The fertiliser consumption per hectare in the state (66.3 kgs) is roughly more than one half the National average (113.3 Kgs). The fertilizer consumption is much lower as compared to some States like Andhra Pradesh (204 Kgs/ha), Punjab (210 Kgs/ha), Haryana (167 Kgs/ha) and Bihar (140 kgs/ha). There is a great imbalance in the use of different types of fertilizer. NPK are used in the proportion of 23.7: 10.4: 1 against the national average proportion of 6:2.4:1 and the suggested proportion of 4:2:1. Since farmers of the State use mainly traditional inputs like own farm produced seeds, manure and primitive implements like wooden sickle, plough, spade, hoe and less of modern and purchased inputs like hybrid seeds, fertilizers and machinery like pumpsets tractors, threshers etc. they get low yield per hectare.

Lack Of Institutional Credit

Majority of the farmers (83%) of the State are small and marginal farmers who have their zero or negative saving and they cannot purchase the modern farm inputs unless they have access to the credit from institutional sources, commercial banks and co-operative credit agencies. However, the institutional credit to the farmers of the State is very much lacking. The credit-deposit ratio (CDR) in Jharkhand was 40.8% in Dec'2008 against the national average of 70%. It was 32.5 % in the rural area and 31.5% in the semi-urban area⁶. As the law and order situation of the rural area is disturbed due to naxalite problems, many rural bank branches remain non-functional⁷. It is reported that the agricultural advances made by the banks till sept'2008 was Rs. 365 crore against the target of Rs. 2500 crore⁸.

The Cooperative credit institutions in the State are more or less dormant due to large overdues. There are on average 25 villages per Primary Agricultural credit society (PACS) in Jharkhand against the average of 7 villages per PACS in the country. Further, only 18.2% of co-operative members borrowed loans with an average borrowing of Rs. 1586 against the national average of 37.6% of borrowing members with an average borrowing Rs. 8902.⁹

Poor Progress Of Village Electrification

In Jharkhand 30.7% of villages are electrified against the national average of 84.3% and per capita power consumption in agriculture is 34 Kwh against 272Kwh in Gujrat, 249Kwh in Haryana and 248 Kwh in Punjab.¹⁰ Electricity supply in electrified villages is irregular, erratic, and insufficient, due to which farmers are not able to utilize ground water for irrigation. In absence of electricity they use diesel powerset which provide more costly irrigation.

Measures For Agricultural Development in Jharkhand

We may suggest certain measures to raise agricultural productivity and production in the State. The first measure suggested is making a heavy investment in rural infrastructure including rural roads,

irrigation, water harvesting, storage & marketing, food processing, agricultural research etc.

Long back some rivers were identified as technically and economically feasible for construction of canal irrigation. These included Amanat, Auranga, South koel, kanhar, Sankha etc. The canal construction works on these rivers should be taken up on a priority basis to increase area under irrigation. Further, the swarnarekha multi-purpose project which was sanctioned in 1977 remains incomplete. On completion this project will provide irrigation to 2.65 lakh hectares of land to only three States, namely Jharkhand, Orissa and West Bengal. Jharkhand would have a share of 68.6 thousand hectares of irrigation. Uptill now, this project provides irrigation to 500 hectares of land from chandil canal against govt's claim of 2000 hectares¹¹. It is suggested that this project should now be taken up by the Central government as has been demanded by Jharkhand government in view of 10 times increase in cost since its sanction and need for forest clearance¹².

Jharkhand is receiving central assistance for 6 irrigation projects under AIBP programmes. Since there are several incomplete projects, works on all these projects should be taken up expensively; as more area can be brought under irrigation with less cost under these projects. The Central government has the norm of providing assistance for new ones only after completion of old projects. This norms should change Simultaneously, the State should also increase its efficiency in implementation of projects. Jharkhand has a large number of rivers, rivulets and other water bodies which contain water upto the month of February. Water of these bodies should be utilized for supplementary irrigation to kharif crops and 1 to 2 irrigation for rabi crops through lift irrigation scheme. Bihar Hill Area Lift Irrigation Corporation(BHALCO) had been set up to provide Lift irrigation to hilly and uplands. A large number of lift irrigation works had been constructed in Palamu, Gumla, Lohardaga, Singhbhum, Santhal Pargana, etc. But these schemes have now become dysfunctional. BHALCO was renamed as JHALCO after the formation of Jharkhand State. But it is taking up no scheme. The employees of this organization have either left or go without salary. The lift irrigation scheme needs to be started on a large scale to bring additional areas under irrigation.

Jharkhand has rocky aquifer over a large part of its geographical area so that the utilization of ground water for irrigation needs rig boring facility which is costly for the farmers. The government should provide rig boring facility at a subsidized rate.

Water Harvesting And Watershed Management

There is a significant scope for increasing area under irrigation through water harvesting, storing of rain water through construction of check dams, ponds, etc and recharging rain water through social forestry. The State should encourage and assist the farmers for watershed Management, restoration of traditional water bodies as well as construction of new ones. This measure will not only increase area under irrigation but also check soil erosion.

Other Measures

- 1.) Making more funds available to Agricultural university and centres of all India Council for Agricultural Research for research work leading to discovery of HYV seeds suitable for different geo-physical conditions.
- 2.) Ensuring adequate and timely Institutional credit to the farmers, simplification of procedure for sanction and disbursement of loans and issue Agricultural credit cards to all farmers.
- 3.) Arrangement for supply of inputs and marketing of farm's produce including storage.
- 4.) Improving soil fertility: The farmers should be motivated to get their soil samples tested at soil testing laboratory and use the soil nutrients according to the soil deficiency. Lime should

be applied on acidic soil along with soil organic matter through compost(vermicompost e.t.c) and manure.¹³

- 5.) Provision of Extension Services: The extension agents should be provided regular training about the latest developments of new seeds and crop practices and they should motivate the farmers to use the same.
- 6.) Diversification of farming activities: Farmers should be motivated and assisted to diversify their agricultural activities into dairy, poultry, goatry, fishery, sericulture, horticulture, flower, mushrooms, agro processing and other market driven activities. There is a good scope for agricultural diversification in the State. These activities have the potential to provide higher income and employment to the farmers with their small size of holdings.

Conclusion

Jharkhand's agriculture is characterized by its low productivity which has resulted into a high incidence of rural poverty. It is a pity that there has not been any perceptible improvement in the economic condition of the people and rural infrastructure such as irrigation, water harvesting, rural connectivity and communication, storage & marketing etc. due to ill-governance, political instability and corruption. The State needs to make a heavy investment in rural infrastructure including irrigation which is the major stumbling block to agricultural prosperity. The banking and co-operative institutions should increase their lending to the farmers. Further, the agriculture needs to be diversified into dairy, poultry, fishery, horticulture, sericulture, mushrooms, flowers, medicinal plants etc. to increase the farm income and employment. After these measures are taken, there would be a higher possibility to raise agricultural productivity and production and improve the economic condition of the rural people.

Notes

- 1.) Planning Commission 'Eleventh Five Year Plan', Vol III, Page 100
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Impact of Microfinance on Interlinked Credit Transactions in the Farming Community: An Empirical Evidence from a Costal District of Orissa

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Present study reflects the interlinked credit transactions in different farmers' categories. Various forms of interlinked credit transactions which are in practice in the farming communities, is discussed. The number of interlinked credit transactions of the microfinance clients is compared to the number of interlinked credit transactions of the non-microfinance clients in category wise i.e., big farmers, medium farmers, small farmers and land less labourers. Also different forms of interlinked credit transactions are compared based on their dominance of existence. The study was carried out with "Target Group" Vs. "Control Group" methodology where the target groups are consisted of microfinance clients and the control group is consisted of non-microfinance clients.

The study came out with interesting results showing the interlinked credit transactions among microfinance clients were lesser than that of non-microfinance clients. Again the study resulted that the big farmers and medium farmers had lesser interlinked credit transactions than small farmers and landless labourers in both target group and control group.

Keywords : Micro Finance, Credit Interlink

Introduction

Rural India has been a burden of indebtedness and the exploitation of rural households, especially the agriculturists in the informal credit market is one of the most pervasive and persistent features of rural India. Indian peasants are born in debt, live in debt and die in debt (Darling, 1925). Farming being a seasonal production practice and the income is irregular; the farmers need credit for production as well as consumption. The existing rural and agricultural formal credit structure is less extensive in India and is reflected by its less penetration, outreach and low target clients. This had resulted the dominant role of informal credit structure in the rural and agricultural credit market.

The major sources of informal credit to the farmers and rural households are relatives, neighbours, friends and money lender. Credit from relatives, neighbours and friends are mostly free from transaction cost and collateral. Villagers and farmers move to money lenders when credit requirement is high. Credit from money lenders involves high interest rates and collaterals (Sharma and Zeller, 2000). It has been seen that the credit derived from informal credit market in rural set up mostly involves interlinked credit transactions.

Interlinked credit transaction a common feature in rural India and more dominant in the poor states like Orissa where informal credit system dominated the rural credit market. Interlinked credit transactions could be as "When more than one transactions takes place between the same two parties of an exchange process with in a given period of time, the terms of such trades are jointly determined". Mostly interlinked credit transactions observed between (i) credit and tenancy, (ii) credit

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and labour and (iii) credit and sale or purchase of outputs and factors of inputs. Thus the rural and / or agricultural credit markets get interlinked with other markets which include land, labour, outputs and factor inputs.

For example, interlinking between credit and labour, where the employer or land lord enters into a forward labour contract with the borrower through provision of a loan. Also poor farmers overcome credit constraint by entering interlinked sharecropping contracts with land lords wherein the landlord provides credit for necessary inputs. Similarly, in credit-labour transaction (which is a form of interlinked credit transaction) the lender gives a loan to a farmer and the farmer repays the loan by working as a labourer for the lender for a predefined period where the cumulative wages of the loaner will be equal to the principal along with the interest of the loan.

There are various form of credit interlinking, i.e, (1) Credit-Product, (2) Credit-Input, (3) Credit-Input Product, (4) Credit-Labour, (5) Credit-Land, (6) Credit- (Land)- Labour, (7) Credit-Leased in Land, and (8) Credit- (Product)-Labour (Sohi and Chahal, 2004).

Review Of Literature

In Indian Rural scenario, credit from informal scenario involves interpersonal trust between the borrower and lender. Credits can not stand alone rather it involves some collateral often tangible. Since tangible as well as marketable collaterals are not always available, often this results into interlinking credit transactions with markets for inputs and outputs. This leads to joint rather than independent determination of the market prices of all interlinked commodities and services. As imperfection and incompleteness of markets being rules especially in rural agricultural settings of India and the lenders tend to influence the terms and conditions for credit because the borrowers are weaker parties. Due to the above reasons, the attributes of credit (Magnitude, duration, forms of disbursement & recovery, collaterals etc.) vary over time and space and as per the influence of the stronger parties, most often the lenders (Reddy, 1992; Bhaduri, 1986; and Mahajan 1998).

In India, there is a dominance of informal credit providers and interlinked credit transactions in the rural input and output market (Mishra, 2007). Interlinked transactions and exclusive dealing between specific agent pairs exists across multiple markets, such as bundling of credit with tenancy, employment or marketing contracts (Mookherjee and Ray). The households who have higher per capita income opt for formal sources of credit (Besley, Jain and Tsangarides, 2001) and the household who have less per capita income, often termed as poor, unprivileged and unbankable opt for informal credit sources and hence fall in credit interlinking. This act as a device for stronger party (lender) to extract surplus from weaker parties (Borrowers) (Bhaduri, 1986; Reddy, 1992). The informal credit is being used by higher income section of villagers or farmers when they are unbankable before the formal financial systems due to the inability to comply with loan collateral requirements (Klein, Meyer, Hannig, Burnett and Fiebig, 1991).

Primarily the money lender remains as the dominant party in credit interlinking in agricultural input and output market where the agricultural input and outputs are remained as the collateral. The rates of interest charged are exorbitant, but the cultivator loaners are forced to pay it, because institutional credit supply is inadequate. This results to the constant exploitation to the loaner and many of them resorting to end their lives when they can no longer bear the burden of debt (Gill 2003). In some studies, it was found that the interest rates are quite high in interlinked credit transactions than non-interlinked credit transactions (Mishra, 2006). As the interlinked credit transactions are more

evidence in poor section of people, it results the poor into more poorer. Also there are evidences where interlinked credit transaction found to beneficial especially in case of failure of credit market and product market (Jayne, Yamano and Nyoro; 2004).

In practice mostly loan accessed from money lenders are frequently tied to the borrower's existing asset position and production mix (Conning and Udry). Interlinked contracts act as a substitute to collateral. These interlinked credit transactions are seen in the informal financial sector of many countries, including in industrialised countries (dei Ottati, pp. 534-543, Rodriguez-Meza, 2004). They are based on the principle that "lenders who are landlords or merchants may use the contractual terms in these other exchanges to affect the probability of default" (Hoff/Stiglitz, p. 240). In the presence of moral hazard lenders require borrowers to bear some contractual risk, and if this risk is sufficiently large, farmers will prefer not to borrow even though the loan would raise their productivity and expected income (Boucher, Guirking and Trivelli, 2005).

Most often interlinked contract set up in monopolistic arrangement in which a lender set interest rate and output price. An increase in the buying price increases the volume of borrowing or, conversely, the volume of lending through its effect on income, assuming no constraints on the lender's supply of funds (Bautista, 1991).

Interlocked transactions of credit and delivery of the products seems to be sustainable which may not be equitable in the prospects of product marketing. (Strasberg 1997; Goetz 1993; Minot 1986; Dorward, Kydd, and Poulton 1998).

Methodology

Puri district of Orissa was purposively selected for the study. Further three stage stratified random sampling was conducted. In the 1st stage, blocks were selected, in the 2nd stage, villages were selected and in the 3rd stage farmers were selected. The farmers were again stratified into 4 categories i.e., large farmer (more than 5 acres of land), medium farmers (2-5 acres of land), small farmers (up to 2 acres of land), and landless agricultural laborers who have no land but have leased in land.

Five Blocks of Puri district were randomly selected. The Blocks were Pipli, Sakhigopal, Nimapada, Kakatpur and Konark. From each block 1 village was selected randomly. From each village 16 farmers were randomly chosen in such a way that 8 farmers have obtained microfinance products and services and rest 8 farmers have not obtained microfinance products and services. The farmers obtained microfinance products and services are kept under Target Group and the farmers and the farmers have not obtained microfinance products and services are categorized into Control Group. Two farmers from each farmer's category were selected from one village for each of the Target Group and Control Group.

The study involved data and information on interlinked credit transactions from the period of two years starting from 1st Jan 2006 to 31st Dec 2007. As the farmers find it difficult to recall the types and numbers of interlinked credit transaction, there might be chances of skipping some of the interlinked credit transactions.

Results And Discussions

Under the present study, 40 farmers (10 from each category) were chosen as the Target Group and 40 farmers (10 from each category) were chosen as Control Group. The farmers from the control group have not taken any kind of microfinance products and services from any organizations/institutions. The farmers from the target group have received microfinance products and services, including

micro-credit, micro-insurance and micro-saving services from different agencies like cooperatives, NGO (Non-Government Organization) based MFIs (Microfinance Institutions), NBFI (Non-Banking Financial Institutions) types of MFIs. Many of the microfinance services were delivered to the clients which were organized in form of groups, namely Self Help Groups (SHGs) and Joint Liability Groups (JLGs). Under the SHG based microfinance delivery model, the loans were provided to the groups and the group was deciding on the individual loans for the group members. Unlike the SHG model, under the JLG model, loan was supplied to the individual members but the group was remaining liable of the loan.

Under the study, the interlinked credit transactions of the target group and the control group were mapped for the period of 2 year from 1st Jan 2006 to 31st Dec 2007.

Table 1

Land Holding And Assets Positions Of The Sample Farmers

(Figs in parenthesis represent percentage to the total)

Category of Farmers	Frequency		Average Land Holding (acre)		Average Assets Position (Rs.)	
	TG	CG	TG	CG	TG	CG
Large Farmers (> 5 acres)	10 (25)	10 (25)	6.23 (52.36)	5.88 (58.91)	166420 (45.73)	185440 (47.17)
Medium Farmers (2-5 acres)	10 (25)	10 (25)	2.54 (25.42)	2.76 (27.68)	94560 (25.98)	97190 (24.88)
Small Farmers (up to 2 acres)	10 (25)	10 (25)	1.22 (12.21)	1.34 (13.42)	76320 (21.03)	81800 (20.69)
Land Less	10 (25)	10 (25)	0 (0.00)	0 (0.00)	26350 (7.24)	29800 (7.54)
Total	40 (100)	40 (100)	9.99 (100)	9.98 (100)	363850 (100)	385190 (100)
Average	10	10	2.4975	2.495	90962.50	96797.50

Source: Field Study, June-2008

From Table-1, it can be observed that, there was not too much difference between the target group and control group based on land holding and assets position. The average land holding of the target group was 2.4975 acre against the 2.495 acre of average land holding of the control group. The average assets position of the target group and control group was Rs. 90,962.50 and Rs. 98,797.50.

Table 2

Interlinked Credit Transactions of Target Group and Control Group

There was a difference of 27.45 percent (Table-2) in the number interlinked credit transactions

SI. No	Category of Farmers	Frequency	No. of Credit Interlinked in Target Group	No. of Credit Interlinked in Control Group	Percentage Difference
1	Large Farmers	10	7	7	0.00
2	Medium Farmers	10	11	13	18.18
3	Small Farmers	10	18	21	16.66
4	Land Less	10	15	24	60
5	Total	40	51	65	27.45
6	Average	10	12.75	16.25	27.45

Source: Field Study, June-2008

among the two groups of farmers i.e., target group and control group. The 40 farmers of control group had 65 interlinked credit transactions where as the target group had only 51 interlinked credit transactions. The highest difference (60 percent) in interlinked credit transactions was seen in the category of land less labourers. However there was no difference in the number of credit transactions in the large farmer category where each category had 7 number of credit interlinked.

Table 3

Interlinked Credit Transaction of Target Group from 1st Jan. 2006 to 31st Dec. 2007

Category of Farmers	Frequency	Credit-Product	Credit-Input-Gash	Credit-Input-Product	Credit-Labour	Credit-Land	Credit-(Land)-Labour	Credit-Linked In Land	Credit-(Product)-Labour	Final
Big Farmer	10	1 (1.95)	2 (3.92)	0 (0)	0 (0)	2 (3.92)	0 (0)	2 (3.92)	0 (0)	7 (137.2)
Medium Farmer	10	2 (3.92)	2 (3.92)	2 (3.92)	1 (1.95)	3 (5.87)	0 (0)	1 (1.95)	0 (0)	11 (21.56)
Small Farmer	10	2 (3.92)	4 (7.84)	2 (3.92)	2 (3.92)	3 (5.87)	2 (3.92)	2 (3.92)	1 (1.95)	13 (25.32)
Land Less	10	3 (5.87)	1 (1.95)	1 (1.95)	3 (5.87)	3 (5.87)	2 (3.92)	2 (3.92)	0 (0)	12 (23.41)
Total	40	7 (13.73)	9 (17.64)	5 (9.79)	6 (11.76)	11 (21.56)	4 (7.84)	7 (13.73)	1 (1.95)	51 (100)
Average	10	2	2.25	1.25	1.5	2.75	1	1.75	0.25	12.75

Source: Field Study, June 2008

(Fig in parentheses) represent percentage value of 1st row and 11th column

Types Of Interlinked Credit Transactions

i. Credit -Product : Marketing of the farm products was linked with credit. The borrower obtains credit from the lender to fulfill the farm production, consumption and other requirements. The borrower repays the loan by selling the produce to the lender at a price fixed by the lender. The rate

of interest varied from 30-40 percent.

Table 4

Category of Farmers	Frequency	Credit-Product	Credit-Input-Cash	Credit-Input-Product	Credit-Labour	Credit-Land	Credit-(Land)-Labour	Credit-Leased in Land	Credit-(Product)-Labour	Final
Big Farmer	10	2 (2.07)	1 (1.53)	1 (1.53)	0 (0)	2 (2.07)	0 (0)	1 (1.53)	0 (0)	7 (10.76)
Medium Farmer	10	3 (4.61)	2 (2.07)	2 (2.07)	2 (2.07)	3 (4.61)	0 (0)	1 (1.53)	0 (0)	13 (20)
Small Farmer	10	3 (4.61)	4 (6.15)	3 (4.61)	2 (2.07)	3 (4.61)	2 (2.07)	3 (4.61)	1 (1.53)	21 (32.30)
Land Less	10	4 (6.15)	3 (4.61)	2 (2.07)	4 (6.15)	3 (4.61)	4 (6.15)	2 (2.07)	2 (2.07)	24 (36.92)
Total	40	12 (18.46)	10 (15.38)	8 (12.30)	8 (12.30)	11 (16.92)	6 (9.23)	7 (10.76)	3 (4.61)	65 (100)
Average	10	3	2.5	2	2	2.75	1.5	1.75	0.75	16.25

Source: Field Study, June-2008

(Figs in parenthesis represent percentage to the cell of 6th row and 11th column)

Interlinked Credit Transaction of Control Group from 1st Jan 2006 to 31st Dec 2007

Under this category, the target farmers had 8 transactions (15.68 percent of total transactions) where as the controlled farmers had 12 (18.46 percent of total transactions) transactions which increased 50 percent over the target group. In the target group, there were 1, 2, 2, and 3 Credit-Product transactions in case of big farmers, medium farmer, small farmer and land less respectively. There were more transactions of this form found in control group over target group i.e, 2, 3, 3 and 4 transactions in big farmer, medium farmer, small farmers and land less respectively (Table-3 and Table-4).

ii. Credit-(Input) Cash : The farmer is supplied with agricultural inputs like seed, fertilizer, pesticide, micronutrients by the lender, more often a lending agency like cooperative, input dealer etc. The borrower repays the loan (inputs) after harvesting. The rate of interest in this type of interlinking was different depending upon the lending agency.

Table 5

Category of Farmers	Credit-Product				Credit-Input-Cash				Credit-Input-Product				Credit-Labour				Credit-Land				Credit-(Land)-Labour				Credit-Leased in Land				Credit-(Product)-Labour			
	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit	Frequency	Percentage	Value	Unit
Big Farmer	10	20.00	2.07	ha	10	20.00	1.53	ha	10	20.00	1.53	ha	10	20.00	2.07	ha	10	20.00	2.07	ha	10	20.00	2.07	ha	10	20.00	2.07	ha	10	20.00	2.07	ha
Medium Farmer	10	20.00	4.61	ha	10	20.00	2.07	ha	10	20.00	2.07	ha	10	20.00	4.61	ha	10	20.00	2.07	ha	10	20.00	2.07	ha	10	20.00	2.07	ha	10	20.00	2.07	ha
Small Farmer	10	20.00	4.61	ha	10	20.00	6.15	ha	10	20.00	4.61	ha	10	20.00	4.61	ha	10	20.00	2.07	ha	10	20.00	4.61	ha	10	20.00	2.07	ha	10	20.00	2.07	ha
Land Less	10	20.00	6.15	ha	10	20.00	4.61	ha	10	20.00	2.07	ha	10	20.00	6.15	ha	10	20.00	6.15	ha	10	20.00	2.07	ha	10	20.00	6.15	ha	10	20.00	2.07	ha
Total	40	80.00	18.46	ha	40	80.00	15.38	ha	40	80.00	12.30	ha	40	80.00	16.92	ha	40	80.00	9.23	ha	40	80.00	10.76	ha	40	80.00	4.61	ha	40	80.00	16.92	ha
Average	10	20.00	3.00	ha	10	20.00	2.50	ha	10	20.00	2.00	ha	10	20.00	2.75	ha	10	20.00	1.50	ha	10	20.00	1.75	ha	10	20.00	0.75	ha	10	20.00	1.00	ha

Frequency, Percentage, Value are calculated on the basis of total transactions of 65 in the control group.

Interlinked Credit Transaction of Target Group and Control Group from 1st Jan 2006 to 31st Dec 2007

The study found out that there were 9 (17.64 percent of total transactions) Credit–(Input)-Cash transactions carried out in target group and 10 transactions (15.38 percent of total transactions) of this form carried out in the control group. In the big farmers' category, the target group had more transactions than that of the control group where as in the landless category, control group had 30 percent more transactions than the target group (Table-5). The number of interlinked credit transactions were same for target group and control group in medium farmer and small farmer category i.e., each 2 and 4 respectively.

iii. Credit- Input : Products: In this form the lender was an input dealer. The lender supplied loans inform of inputs and recovered the loan in term of output i.e., the lender took output from the farmer which was of equal worth as the principal (price of input) and interest (interest on price of input).

There were 5 and 8 Credit –Input- Products transactions in target group and control group respectively. The total number of transaction in big farmer category in control group was 1 while there were no transactions in target group. The average transactions in target group and control group were 1.25 and 2 respectively (Table-3 and Table-4).

iv. Credit-Labur : Under this type of credit interlink, the lender provided loan to the borrower and the borrower repay the loan and interest inform of labour.

The average Credit-Labur transactions in target group and control group were 1.5 and 2 respectively. Credit- labour transactions in target group were 11.76 percent of the total interlinked credit transactions where the credit-labur transactions were slightly more for control group (12.30 percent) (Table-3 and Table-4). Interlinked credit transactions were found 33.33 percent higher in control group as compared to the target group (Table-5). There were absolutely no transactions recorded among the big farmers in both target group and control group. However, there were more transactions in control group than the target group among medium farmer and landless labourers. In the small farmer category, the number of transactions remained same for both target group and control group (2 transactions) but in the same category the credit-labur transaction in target group was 33.33 percent of the total credit-labour transactions and in case of control group, it was 25 percent of the total credit-labour transactions.

v. Credit-Land : Credit was linked with land. Land was kept as security collateral and the title of the land was transferred to the lender. The borrower recovers the land and its title after repaying the loan. When the borrower could not pay the loan i.e., principal and interest with in the stipulated period, the borrower was forced to sell the land to the lender with no more transactions or payments.

Surprisingly, the interlinked credit-land transactions found to be same for target group and control group. In case of target group, credit- land transactions were 21.56 percent of the total interlinked credit transactions and the credit- land transactions were less (16.92 percent) for the control group. Also the interlinked credit-land transactions were found to be same in both the groups across all the categories.

Very interestingly, the credit and land transaction happened in case of landless labourers. The landless labourers previously had lands which were highly unproductive and they had given these lands for collateral for certain loans. After, certain period, when the time to repay the loan advanced, they could not repay the loan and lost their unproductive land.

vi. Credit – (Land) Labour: Under such kind of interlinking, land was supplied by the landlord. All the agricultural inputs like seed, fertilizer, pesticide, micronutrients were shared by the landlord and borrower at a ratio 50:50 basis. The borrower pays 50 percent of the produce after harvesting

to the landlord.

There were 4 and 6 credit-land –labour transactions recorded in target group and control group respectively. The credit-land –labour transactions for control group was 9.23 percent of the total interlinked transactions and the credit-land –labour transactions for the target group was 7.84 percent. The average transactions of this form for target group and control group were 1 and 1.5 respectively. There were no credit –land –labour transactions recorded among big farmers and medium farmers as they have good amount of land remained with them. The credit–land–labour transactions were same for small farmers (2 nos.) in both the groups and more in case of landless in control group.

vii. Credit – Leased in Land : In this for of interlinked credit transaction, the landlord lease out the land for some years and the landlord was supplied with a fixed amount of money in every year for the land irrespective of the amount of the produce harvested.

The average credit-leased in land transactions was found to be same for target group and control group (1.75). Also the total number of transactions of this kind remained same for both the groups. The credit-leased in land transactions of target group was higher (13.72 percent) than control group (10.76 percent) as compared to total number of interlinked credit transactions (Table-3 and Table-4). The big farmer category, the target group recorded more credit-leased in land transactions where as in the small farmer category the control group recorded more credit-leased in land transactions (Table-5).

viii. Credit – (Product) – Labour : Under such kind of interlinking, the borrower supply farm produce to the lender and the lender repay this loan (which was taken as farm produce) inform of labour.

There was only one credit – product – labour transaction found in target group (incase of small farmers) but there were 3 transactions of this type found out in control group (1 transaction in small farmer category and 2 transactions in landless category). Credit – product – labour transactions of target group was 1.96 percent of the total interlinked credit transactions where as the control group had 4.61 percent of credit – product – labour of the total interlinked credit. (Table-3 and Table-4).

The average interlinked credit transactions of the target group were 12. 75 and the same for the control group was 16. 25. In the target group, highest percentage of transactions was located in the category of small farmers (36 percent) followed by the landless with 29.41 percent. The lowest interlinked transactions in target group were found in case of big farmer category (13.72 percent) (Table-1 and Table-3).

The control group had more average transactions (16.25) as compared to target group. There were as many as 65 interlinked credit transactions recorded in control group. The highest transactions were found in landless category with (37 percent of the total interlinked credit transactions) followed by landless category (32 percent) in control group. It was found that the big farmers had the lowest interlinked credit transactions in both target group and control group. Again, the interlinked credit transactions in the category of big farmers and medium farmers together were lesser than the interlinked credit transactions in the category of small farmers and landless labourers.

The study found that the existence of Credit-Land transaction in the target group was highest with 21.56 percent, followed by Credit-Input-Cash transactions (17.64 percent). Credit- (Product)-Labour transactions were found to be the least with 1.96 percent of the total interlinked credit transactions in

the target group. In the control group the results were different and the Credit-Product transactions had dominated with 18.46 percent. However, the Credit- (Product)-Labour transactions were the least in the control group with 4.61 percent. It can be observed that both in the target group as well as the control group, the Credit- (Product)-Labour were the least.

Conclusion

The study reflected that the microfinance interventions have helped in bringing down interlinked credit transactions especially in the farming communities in Puri district of Orissa state of India. Interestingly, it was found that despite of the microfinance programmes there were evidences of interlinked credit transactions among the microfinance clients. The reason being the interlinked credit transaction is tagged up mostly with informal credits and interlinked credit transactions will remain as long as the informal credits exists in the agricultural financial market. This might be due to the existing microfinance programme are not very intensive and these programmes largely targeting to village based traders and entrepreneurs than the farmers.

Due to the microfinance programmes, different types of interlinked credit transactions have definitely reduced but not fully erased from the credit market as interlinked credit. In non-microfinance areas, the interlinked credit transactions reduced from big farmers to landless while there was a variation in microfinance area where small farmers had more interlinked credit transactions then the landless. Due the market dynamics of labour work and sale of produce, the interlinked credit transactions exist irrespective of microfinance operations.

It was found out that, even though microfinance programmes are aimed at removing the exploitative interlinked credit transactions, but there were instances that some of the interlinked credit transactions were beneficial for both the parties i.e., lender and loaner. Some time the loaner is unsure of availability of labour work or market for sale of produce and, through interlinked credit transaction, the loaner is assured of the labour work or market for sale of produce even though the labour work and/or produce the loaner provide to the lender is under rated. At the same time the lender is assured of the recovery of the loan in different forms.

The study also questions the universal thought "Interlinked credit transactions are exploitative and microfinance programmes can remove the exploitative interlinked credit transactions", rather the study found out that interlinked credit transactions as a dependent variable not only depend upon microfinance but also depends upon other correlated variables like availability of labour work and market for sale of produce as long as the informal credit market exists and; the scenario might be different in case of absolute zero informal credit market. The study suggests for the future researchers to analyze the interlinked credit transaction taking the correlated variables like microfinance, sale of inputs, sale of outputs and availability of labour work where there might be chances of multi-co linearity as long as the informal credit market exists.

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