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Impact of Microfinance on Farm Income of Small and Marginal Farmers in Western Tamil Nadu

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ABSTRACT

The small and marginal farmers were more dependent on the private credit sources with higher interest rate for their family needs and timely agricultural practices. Drought, pest and disease incidence, higher input cost, less product price and non-timely availability of credit were the major reasons for indebtedness of the small and marginal farmers. In this context, microcredit through bank linkage self-help groups (SHGs) served as the credit source to the small and marginal farmers. A study was conducted on the tribal and non-tribal SHG and non-SHG members in western Tamil Nadu in order to study the impact of microfinance on income of members and non-members of self-help groups on the selected tribal and non-tribal women in the study area. In the case of tribal SHG members, income from agricultural source was Rs. 48772 compared with Rs. 29900 of non-members. The average annual income of SHG members in before operation period was Rs. 11944 and it was Rs. 21415 in after implementation period and the difference was Rs. 9471. The non-tribal SHG member's average annual income difference between the two periods before and after implementation period was Rs. 17332. Non-follow up practices from government officials was the main problem faced by SHG members in tribal sample farmers.

Keywords: Micro credit, Self-help groups, Indebtedness, Uncertainty, Tamil Nadu

JEL.: C33, Q14, Q15

I

INTRODUCTION

In India, the marginal, small and semi-medium farmers are contributing 95 per cent of the total farmers (Agriculture Census, 2011-12). The average size of holdings of the small and marginal farmers is about 0.38 ha when compared to 17.37 ha for large farmers, which cannot generate adequate employment and income from crop cultivation (Dev, 2017). Agricultural development requires timely and adequate supplies of essential farm inputs. But the investment capacity of majority of the Indian farmers is quite low as they are poor and they cannot afford to meet the increasing demand for the purchase of improved seeds, recommended dosage of fertilisers, hiring costly farm machinery etc. So, lack of finance and its accessibility are one of the main reasons for low productivity of Indian agriculture. Furthermore, the absence of adequate farm and non-farm employment opportunities lead them to perpetuate in poverty trap.

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In India, the share of formal sources varies from 22.6 per cent to 58 per cent for small and marginal farmers. In states like Tamil Nadu, Punjab and Andhra Pradesh, the dependency of small and marginal farmers on informal sources is higher. According to NSSO (70th round) around 52 per cent of the farm households remained indebted in India as a whole of which the state of Andhra Pradesh had the highest share of indebted agricultural households in the country (92.9 per cent) and Tamil Nadu (82.5 per cent).

Tenant farmers and marginal farmers were more dependent on the informal sources for their credit needs in farm inputs as well as their family needs as compared to the medium and large farmers. A higher percentage of investment is carried out through informal sources of borrowings such as moneylenders, traders and input dealers by the landless (40.6 per cent), marginal (52.1 per cent) and small farmers (30.8 per cent) (Kumar *et al.*, 2017).

The indebtedness through formal sources is lower for scheduled tribes as compared to others across social groups, because they do not have any collateral security to get the loan from informal sources.

Microcredit can play an important role in agricultural development in the small, marginal and tenant farmers. One element of an effective strategy for poverty reduction is to promote the effective use of farm inputs. This can be done by creating opportunities for raising agricultural productivity among small and marginal farmers. Many microfinance institution loans are used for agricultural production, trading, processing and transport, resulting in an increase in the use of agricultural inputs and increased output of agricultural production (Zohir and Matin, 2004). Self-Help Group (SHGs) plays a significant role in reaching out and connecting with rural poor women. These groups enable its members to gain their identity as individuals, while realising and utilising the immense power of mutual aid (Mohammad and Mohammed, 2007).

Pandit *et al.* (2007) in his study on financing agriculture, a study of Bihar and West Bengal potato cultivation has identified that in Bihar only about 15 per cent farmers opted for institutional loans, whereas, it was more than 34 per cent in case of non-institutional loans. Input traders, fellow farmers, money lenders were the important non-institutional sources in Bihar.

Ashaolu *et al.* (2011) conducted a study in Nigeria which revealed that the total cost per hectare of microcredit user farmers is higher (\$266.87) than that of non-credit user farmers (\$209.40), indicating misallocation of resources by credit-user farmers. Again, profit per hectare of microcredit user's farmer is greater (\$285.04) than that of non-credit users (\$178.41), suggesting that access to credit could improve farmers' productivity and higher income in the form of revenue and profit.

Ibrahim and Siegfried (2013) conducted research in Sudan and the results showed that, farm profits for all categories were \$161.97. The microcredit users were found to be better off with a profit of \$168.13 compared to \$ 155.28 for microcredit non-users. Results obtained from a probit model showed that savings, value of assets and incomes are the significant variables determining the credit constrained conditions.

Puhazhendhi (2000) in his study in Tamil Nadu observed that 38 per cent of the members were able to sign during the pre-linkage period but as a result of SHGs group formation the literate members increased considerably and 85 per cent of them learnt to sign after the group formation. About 27 per cent of the members had educated their children up to the school level during the post linkage with SHGs period. The study revealed that the members regularly started eating wheat and rice, after group activities which were earlier consumed by them only during festivals.

In this background, an attempt is made to study the impact of microfinance on income of members and non-members of self-help group on the selected tribal and non-tribal women in the study area.

II

METHODOLOGY

Ashenfelter and Card (1985), the use of difference-in-differences methods has become very widespread. For the present study, the information was collected for the pre and post-program period and compared with the control group as well (Wing *et al.* 2018; Palanisami *et al.*, 2014).

For each observation ‘i’ let us define a variable as if the observation is from the control group and if it is from the SHG group. Similarly for each observation *i* define a variable as if the observation belongs to time $t = 0$, that is before the SHG program and if the observation belongs to time $t = 1$, that is, after the SHG program. Now form the regression equation,

$$y_i = a + b\delta_i + cT_i + d\delta_i T_i \quad \dots(1)$$

The following results can be easily checked:

Observation belonging to	δ	T	y_i
Non-SHG before the program	0	0	$\bar{Y}_{c0} = a$
Non-SHG after the program	0	1	$\bar{Y}_{c1} = a + c$
SHG before the program	1	0	$\bar{Y}_{T0} = a + b$
SHG after the program	1	1	$\bar{Y}_{T1} = a + b + c + d$

So using Equation (4)
Impact of the program

$$= ((a + b + c + d) - (a + b)) - ((a + b) - a) = d \quad \dots(2)$$

TABLE 1. DOUBLE DIFFERENCE METHOD OF IMPACT ASSESSMENT OF TRIBAL AND NON-TRIBAL SHG MEMBERS PROGRAMME

Particulars (1)	SHG farm women participants (2)	Non-SHG participants of farm women (3)	Difference across groups (4)
After SHG programme	D1	C1	D1 - C1
Before SHG programme	D0	C0	D0 - C0
Difference across time	D1-D0	C1-C0	Double difference (D1 - C1)-(D0 - C0)

Farm level data were collected from both tribal and non-tribal farm women, i.e., who have participated in the SHG programme and who have not participated and calculated separately. This enables the use of the double difference method to study the impact of the SHG programme.

The resulting measures can be interpreted as the expected effect of implementing the SHG programme both in tribal and non-tribal farm women households. The columns distinguish between groups with and without the programme and the rows distinguish between before and after the programme. Before the SHG programme, one would expect the annual family income to be similar for the two groups, so that the quantity (D0 - C0) would be close to zero. Once the SHG programme has been implemented, however, one would expect differences between the groups as a result of the improvement in knowledge of the farmers about the farming technique and communication skills due to the SHG programme provide training to them. The impact of the programme, however, would be better assessed considering any pre-existing observable or unobservable differences between the two randomly assigned groups, i.e., the double-difference estimate, which is obtained by subtracting the pre-existing differences between the groups, (D0 - C0), from the difference after the programme has been implemented, (D1 - C1).

Double in Difference (DID) methodology is becoming a popular tool for studying the impact analysis as it has the advantage to control the time-invariant characteristics of the farmers when comparing the members and non-members of a SHG programme.

Garrett Ranking Technique

The constraints in the adoption of soil conservation technologies were analysed based on Garrett’s scoring technique. Garrett ranking was applied to rank a set of factors as perceived by the sample respondents based on certain criteria (Garrett and Woodworth (1997).

$$\text{Per cent position} = \frac{100(R_{ij} - 0.5)}{N_j} * 100$$

where,
 R_{ij} = the rank of the i-th item by j-th individual and

N_j =the number of items ranked by the j -th individual

III

DATA AND VARIABLES

The two time periods were classified as before implementation of SHG programme upto the year 2012 and after implementation in the year 2018 and control group which is non-SHG programme before as well as after period collected data as panel data. Hence an approach that considered with and without as well as before and after situations is significant.

A total of 120 women farm households were selected comprising 40 women farm households from tribal villages in Coimbatore district and 40 women farm households from non-tribal in Erode district by employing stratified random sampling procedure to study the impact of the SHG during January, 2018. In order to make a comparative study, 20 women farmers in these villages, of which each ten farm women households from tribal and non-tribal of who have not participated in SHG programme were selected as control. Thus, a sample of 80 farmers was covered for the impact study. The required information from the respondents was gathered by personally administering the interview schedule. The primary information collected from the women farm households' annual net income. In addition, the details of the trainings attended and subject matter learnt during the training programme were collected from the respondents. The base line data collected in 2012 was also used for cross checking the annual net income of the farmers prior to SHG training programme.

IV

RESULTS AND DISCUSSION

From Table 2, the average age of the women farmers were assessed to be 39 years in tribal SHG members and 40 years in non-tribal SHG member's households. Education was lower in tribal farms as compared with non-tribal farms. Experiences in farming activities were high in non-tribal SHG members and non-members in the selected sample farmers.

TABLE 2. DEMOGRAPHIC PARTICULARS OF MEMBERS AND NON-MEMBERS OF SELF-HELP GROUP OF TRIBAL FARMERS OF SELECTED STUDY AREA

Particulars (1)	Tribal SHG members (2)	Tribal Non-SHG members (3)	Non-Tribal SHG members (4)	Non-Tribal Non-SHG members (5)
Age (years)	39.30	47.70	40.10	55.70
Education (years)	5.35	3.70	9.27	6.10
Experience (years)	11.97	16.90	15.03	28.00
Family size (numbers)	4.70	4.10	4.63	4.60

From the Table 3, the average farm size of sample farm indicates less than one hectare to 1.90 hectare of land holdings. The farmer's income from agricultural source was in members of SHGs of Rs.48772 compared with Rs.29900 of non-members of tribal farmers. In members of non-tribal farmers agricultural income was as high as Rs. 95600 as compared with non-members as well as tribal SHG member farmers. In non-tribal farmers, members of SHGs successfully operated in their groups with more than ten years and also repayment rate was also greater as compared with tribal SHG members.

TABLE 3. AVERAGE FARM SIZE AND INCOME PARTICULARS OF MEMBERS AND NON-MEMBERS OF SELF HELP GROUP OF SELECTED STUDY AREA

Particulars (1)	Tribal SHG members (2)	Non-SHG members (3)	Non-Tribal SHG members (4)	Non-Tribal Non-SHG members (5)
Farm size	1.65	1.90	1.39	0.96
Agricultural net income	48772.33	29900.00	81300.00	33000.00
Total net income	52639.00	36300.00	95600.00	55400.00

In non-tribal farm women members in Erode district cultivated flower crops like jasmine and chrysanthemum and milk yielding cows as their main income source. So, the need for credit was frequent and adequate for their farm requirements like plant protection, plant growth supplements and other farm operations from microcredit through nationalised banks and PACBs.

Tribal SHG members in Coimbatore district were mainly cultivating paddy, maize, sorghum and vegetable crops like tomato, chillies and chrysanthemum. The agricultural lands were adjoining the protected areas and therefore wildlife disturbances in the cultivation area seem to be a major problem. Farmers used protective measures like fences, trenches and cultivated non-eating agricultural crops. Losses due to wildlife were compensated but not appropriate. In tribal farmers 43 per cent were tenant farmers and also paid their profit as land rent to the land holders. Thus, their net profit is reduced further other than the cost of production.

The SHG members of tribal and non-tribal women farmer's agricultural income as well as their total net income were larger compared with the non-members of sample farm households.

From the Table 4, it is evident microfinance borrowing was higher in non-tribal SHG members of Rs.45,000 because, they utilise microfinance loans for their financial needs of both agricultural and household purposes and repay regularly. Therefore, they again got the higher loan from the bank. Revenue from flower cultivation was on a regular basis that encouraging the repayment of loan from microcredit. The credit amount was increased based on their regular repayment to banks of the sample non-tribal SHG members.

TABLE 4. MICROFINANCE LOAN PARTICULARS OF MEMBERS AND NON-MEMBERS OF SELF HELP GROUP OF SELECTED STUDY AREA

Particulars (1)	(Rs.)	
	Tribal SHG members (2)	Non-Tribal SHG members (3)
SHG loan amount (Average)	25000	45000
Interest rate	12 per cent	12 per cent

Tribal SHG members also repaid regularly but some of the members could not repay on a regular basis due to non-regular income sources, crop failure and other family expenditures, therefore the other members were also affected due to these challenges in tribal SHG members, however the members earned higher income as compared with non-SHG members.

The details of private borrowing by these members are given in Table 5. Private borrowing was higher in non-SHG members of both the categories of which 76 per cent in tribal non-SHG members and 62 per cent in non-tribal members and it was nil in non-Tribal SHG members, because, they used microfinance loans for their financial purposes of both agricultural and household needs. Among the sample farmers 30 per cent of members borrowed private loan for their spontaneous need of credit. The average private loan amount ranged from Rs.29000 to Rs.37500 higher in both non-members tribal and non-tribal farmers of tribal SHG members and 62 per cent non-tribal farmers borrowed from private lending sources. Interest rate was higher at 36 per cent to 41 per cent of borrowings in all categories of farmers.

TABLE 5. LOAN PARTICULARS OF MEMBERS AND NON-MEMBERS OF SELF HELP GROUP OF SELECTED STUDY AREA

Particulars (1)	Tribal SHG members (Rs.) (2)	Tribal Non-SHG members (Rs.) (3)	Non-Tribal SHG members (Rs.) (4)	Non-Tribal Non-SHG members (Rs.) (5)
Private loan	3620.7	29000	-	37500
Interest rate	41 per cent	36 per cent	-	39 per cent
Private borrowing	30 per cent	76 per cent	-	62 per cent

From the Table 6 and Figure 1, the data reveal that monthly expenditure was higher in non-tribal SHG members as compared with the tribal SHG members and non-members in the sample farmers. Also the total average annual average savings was higher by Rs.17000 in the case of non-tribal SHG members. The tribal SHG members also saved but they distributed among themselves for their requirements. Non-members used their income mostly for their private loan repayment and higher interest rate.

TABLE 6. EXPENDITURE AND SAVING PARTICULARS OF MEMBERS AND NON-MEMBERS OF SELF HELP GROUP OF SELECTED STUDY AREA

Particulars (1)	Tribal SHG members (Rs.) (2)	Tribal Non-SHG members (Rs.) (3)	Non-Tribal SHG members (Rs.) (4)	Non-Tribal Non-SHG members (Rs.) (5)
Monthly expenditure /head	5561	6065	8408.333	5903.3
Total Savings	5033.33	0	17000	0

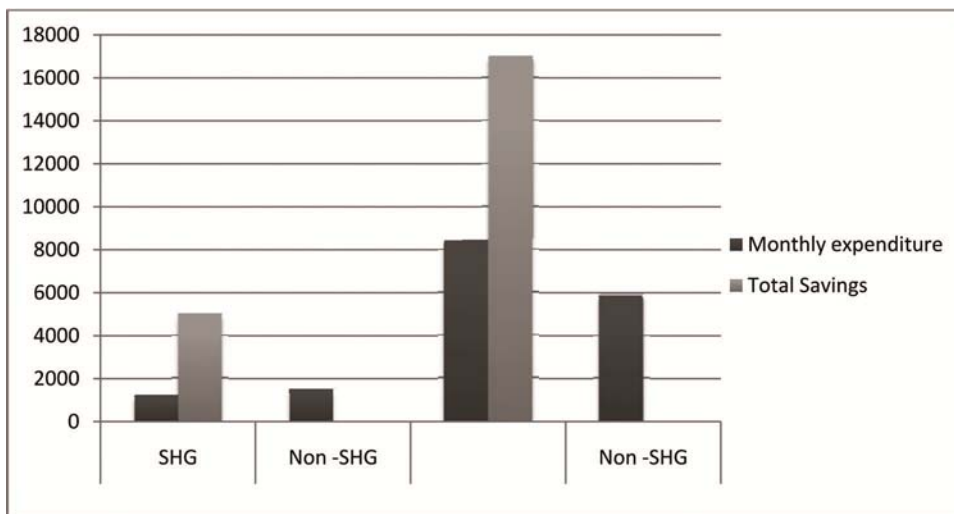


Figure 1. Expenditure and Saving Particulars of Members and Non-Members of SHGs.

Differences in Difference (DID) Analysis of SHG Members and Non-Members of Tribal Women Sample Farmers

In the analysis of DID given in Table 7, the tribal SHG members were found to be more dependent on microfinance for their agricultural operations and family needs. The well-timed credit was distributed at 12 per cent interest rate among the members. The training on agricultural technology imparted on the members increased the productivity of crops. The average annual income of SHG members in before operation period was Rs. 11944 and it almost doubled in after operation period to Rs. 21415 and the difference was Rs. 9471.

TABLE 7. DIFFERENCES IN DIFFERENCE METHOD FOR PARTICULARS OF INCOME IN MEMBERS AND NON-MEMBERS OF SELF-HELP GROUP OF TRIBAL FARMERS OF SELECTED STUDY AREA

Particulars (1)	Pre – SHG members (Rs.) (2)	Post – SHG members (Rs.) (3)	Final Difference (Rs.) (4)
Members	11944.00	21415.00	9471.00
Non members	9222.00	14520.00	5297.00
Double Difference			4173.00

The non-member SHG tribal farmers seem less aware of agricultural technologies as compared with member farmers. They were dependent on private credit sources for their credit needs with higher interest rate. Thus, the average annual income difference of non-members between two periods was lower by Rs.5297 as compared to SHG members. The double difference between members and non-members and before and after implementation programme was Rs.4173 of the SHG of tribal

farmers. The inflation rate effect was compressed by both values taken as 2012 base year value. The significance of the model indicates the p value of 9.39E-09.

RESULTS OF DIFFERENCES IN DIFFERENCE MODEL OF TRIBAL FARMERS

	Coefficients	Standard Error	t Stat	P-value
Intercept	9222.222	1429.99	6.449151	9.39E-09
d1	2722.222	1651.21	1.648622	0.103353
d2	5297.778	2022.311	2.619665	0.010622
B	4173.378	2335.164	1.787188	0.077894

Differences in Difference (DID) Analysis of SHG Members and Non-Members of Non-Tribal Farmers of the Selected Study Area

The results of Table 8 indicate that the non-tribal SHG member's average annual income difference between the two periods as before and after implementation of period was Rs.17332. Since their credit needs were satisfied by microfinance through bank linkage SHGs at 12 per cent interest rate their purchasing power increased and well-timed investment on agricultural operation also increased. Thus the income from agriculture depicted an increase. So, the repayment rate was higher in non-tribal SHG farmers, therefore higher loans were accomplished from banks thus, SHGs were successfully operated with enhanced savings from members.

TABLE 8. DIFFERENCE IN DIFFERENCE METHOD FOR PARTICULARS OF INCOME IN MEMBERS AND NON-MEMBERS OF SELF HELP GROUP OF NON-TRIBAL FARMERS OF SELECTED STUDY AREA

Particulars (1)	Pre – SHG members (Rs.) (2)	Post – SHG members (Rs.) (3)	Final Difference(Rs.) (4)
Members	23027.00	40360.00	17332.00
Non members	20777.00	28056.00	7278.00
Double Difference			10054.00

There was very less difference of Rs. 7278 in non-members because of their dependency on private money lenders for their credit needs with higher interest rate. The non-SHG sample members largely owned less than one hectare land. Therefore, their investment on agricultural operation required less investment, hence, the net return were also less. The major part of their income was used to repay higher interest rate to private credit sources which reduced their investment on protective measures like children education, food, investment in agricultural operation. The significance of the model indicates in the p value of 4.89E-10.

RESULTS OF DIFFERENCES IN DIFFERENCE MODEL OF NON-TRIBAL FARMERS

	Coefficients	Standard Error	t Stat	P-value
Intercept	20777.78	2912.291	7.134512	4.89E-10
d1	2249.715	3362.824	0.668996	0.505525
d2	7278.222	4118.602	1.767158	0.081216
B	10054.28	4755.752	2.114132	0.037784

Constraints

Among constraints in microfinance operations highlighted in Table 9, non-follow up practices from government officials was reported to be the major problem faced by SHG members in tribal sample farmers followed by the need for easy repayment operation (mobile banking) training to group members, micro insurance for their crops, training of agricultural and allied programmes to members, subsidy of agricultural inputs and group members conflicts in the study area.

TABLE 9. CONSTRAINTS IN MICROFINANCE OPERATIONS FOLLOW- UP PRACTICES BY SHG MEMBERS

Constraints (1)	Garret's score (2)	Rank (3)
Non-follow up practices from government officials	81.62	1
Need easy repayment operation (mobile banking) training to group members	72.16	2
Micro insurance for their crops	63.65	3
Training of agricultural and allied programs to members and price and price forecast information distribution	55.12	4
Subsidy of agricultural inputs	50.07	5
Group members conflicts	45.85	6

V

CONCLUSION

The income progression was higher in both tribal and non-tribal members of SHGs from the before and after implementation of this programme as compared with non-SHG members of sample farmers in the study area. In tribal farms, non-diversified and non-regular income were the main reasons for less income and repayment rate compared with non-tribal SHG member farmers. Hence, the government should formulate strategies and programmes to extend technical and financial interventions and promote this programme for more benefits of the tribal and the non-tribal marginal, small and tenant farmers.

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