Participation, Access and Contribution of the Micro- Credit Programme

SujataBera
Assistant Professor of Economics
Raja N L Khan Women's College
Midnapore (West), West Bengal
Email:sujatabera@yahoo.co.in

Abstract- *This paper examines the dependence of the household on the micro-credit movement (SGSY) for accessing the credit and generating income. Households' dependence on the SGSY movement have been analyzed through the household's dependence on other sources of credit, size of SHG loan, contribution of SHG loan to total loan, size of SHG income, contribution of SHG income to total income. The study also explores the effects of the participation in the micro-credit programme on women's financial contribution to their family by using the propensity sore matching methods. The data used in this study have been collected through a field survey in the Midnapore district of West Bengal. One of the important conclusions from this part of our study is that the households' dependence on the non institutional sources of credit is higher among the members of the control group as compared to that of the treatment group and the more women financially contribute to their family support due to their participation in the micro-credit programme.*

Like any other state in India, the micro-credit programme under Swarnjayanti Gram Swarozgar Yojana (SGSY) was launched in West Bengal in 1st April 1999. The most important provision of SGSY is to ensure the participation of poor people specially the poor women in micro-credit programme through the formation of Self Help Groups (SHGs). The major promise of micro credit program is that it makes Government development program more responsive to deliver services specially the financial services in favor of poor and socially disadvantaged women. It provides assistance with subsidy and bank credit to take up income generating activities by the members of the target group. In this context it would be interesting to examine how far the women's participation in the micro-credit program in India gets operationalzed in reality. Specifically, we would examine how does it contribute to reduce the dependence of

households on informal sources for financial resources? Does this access to financial resources help more women to generate income and contribute to their family income?

The studies on the impact of micro-finance on intended beneficiaries have been concentrated on mainly women's ability to access financial resources, dependence on informal sectors for credit by the participants households, and the impact of access to credit on access to asset, income, production, food security etc. Few studies in India have reported that for many women, provision of micro-credit was the first time loan received from formal lending agency by them and in some cases by their family (Padia, 2005). Though the programme provide the space and opportunities to access financial resources to the rural poor women and reduce the dependency on moneylenders for credit, but a vast majority of households were compelled to take loan from non-formal sectors (Padia, 2005; Parthasarathy, 2005). Some studies in Bangladesh and India documented a positive increase on income, consumption and nutritional status and social empowerment of women (Hashemi et al., 1996; Montgomery et al., 1996; Pitt & Khandker, 1998; Rajivan, 2005; Sharma, 2008).

A careful review of literature reveals that most of the empirical studies of the impact on programme participants in terms of their dependence on micro- credit, income pertain to the Grameen Bank experience in Bangladesh and the empirical studies in the Indian context are few and relate primarily to the evolution of SHGs in southern states like Tamil Nadu, Andhra Pradesh, Karnataka and Orissa. Moreover, most of the studies in Indian context, emphasized on to evolution of NGO supported micro-credit programme. The findings of these studies may have limited relevance in West Bengal context in view of different socio-economic and cultural milieu and where most of them were unsupported by NGO's. Moreover, no study concentrates on women's financial contribution to their family support, which is considered as one of the important factors to empower them.

In this paper we analyze the progress of women's participation in micro-credit programme under SGSY in the sample district. The paper is divided into five sections. The profile of the study sample and methodology are presented in Section I. Section II explores the physical progress of SGSY programme with special reference to women's participation and their relationship with concentration of poor people in two selected

districts. In Section III, we discuss contribution of micro-credit to total credit accessed by a household. Section IV deals women's participation in income generating activities (SHG income) and their financial contribution to family income. Section V presents the concluding observations.

I. Data Sources and Methodology

Keeping the objectives of our study in mind, we collected both the secondary and primary data. The secondary data have been collected from relevant documents of the District Rural Development Agency (DRDA) of East Midnapore and West Midnapore districts in West Bengal.

For collection of primary data, we followed a multi-stage sampling procedure. Under this procedure, we first chose three blocks from each district from the lists of 'high', 'medium' and 'low' performing blocks in respect of the SGSY programme. The performance status of the blocks was measured by the percentage of SHGs having Grade-II status in the blocks. In the next stage, applying the same principle, three Gram Panchayats (GP) (the lower level administrative unit in the three-tier panchayat system) were chosen from each block. At the final stage, respondents for the 'treatment group' and 'control group' from the chosen gram panchayats have been selected randomly for collection of primary data. In this way, our sample constituted of a total of 258 members for the 'treatment group' and 197 members for the 'control group'. A structured questionnaire was canvassed to collect information from households and individuals. The field survey was conducted during the period January 2011 to June 2011 and the field information collected pertains to the period July 2010 to June 2011. The field data have been analyzed through tabular presentations.

The micro credit facilitates the access to credit by the rural poor women. So we looked into the dependence of the sample households on the local money lenders and other non-institutional sources of credit and also the contribution of the micro credit in total credit received by them. Our study looked into the extent of dependence of the rural households on the SHG income by examining its share to total income of the households.

The effects of participation duration on the quantum of SHG credit and SHG income are also examined.

To evaluate the effects of participation in the micro-credit programme on the women's financial contribution to family income, we applied the Propensity Score Matching (PSM) method. The main objective of this method to address the 'selection biases' mainly arises due to the differences of observables between the member of the treatment and the control group. Like many other rural development programmes, the SGSY purposively targets the rural poor, especially the rural poor women, so that they can receive credit facilities through this programme. This means that this programme is not assigned randomly across the population of units. Therefore, the observed differences in measured outcome indicators between units who received the benefits of this programme and those who didn't could not be attributed to the programme alone. The measured differences that we observe in the data could just be due to the fact that the participants of the programme were purposely selected. This is often called as the 'selection biases'. Such a bias is likely to arise because of a particular selection criterion used by the group-promoting agencies over the years[1].

For impact evaluation of a non-randomized programme, a comparison group is needed that should look like the treatment group in all respects except one which is that the comparison group did not get the programme benefits. However, in practice, the participants in such a programme are likely to be different from their control (non-participant) counterparts in terms of their distribution of observed covariates, which is termed in the literature as '*selection of observables*'.[2]

The biases that arise due to these observable variables are adjusted through the method of the *propensity score matching* (PSM) (Rusenbaum and Rubin, 1983; Dehejia and Wahba, 1998; Heckman *et al.*, 1997, 1998). The aim of the PSM is to find out a

[1] The SHG promoting institutions, which seek to display the empowerment potentials of the credit program to attract subsidies from the donor agencies, are more likely to target relatively poor women with a lesser degree of autonomy. However, this bias is not very much prominent in our study areas as we considered only the program participants under the SGSY, where financial benefits go directly to the participants.

[2] This is not a problem with randomized assignment (a genuine experiment), since everyone has the same chance ex-ante of receiving the program. The distributions of observed and unobserved attributes prior to the program intervention are the same, whether or not a unit receives the program. Then, the observed ex-post differences in the outcome indicators are attributable to the programme.

'closest' comparison group from a sample of non-participants to estimate the impact of the programme. Here 'closest' is measured in terms of some observable characteristics. The PSM balances the observed covariates between the treatment and the control groups based on similarity of their probabilities of participation (propensity scores).

The propensity score is defined as the conditional probability of receiving the treatment given the pre-participation characteristics (Rusenbaum and Rubin, 1983). Thus,

$$P(X_i) = \text{Prob}\,(D_i=1/X_i)= E(D/X), \qquad (0< p(X_i)<1)$$

where D=(0,1) is the indicator of exposure to the treatment and X_i is a vector of pre-participation conditions. The choice of the variables must include all the factors influencing the assignment of the programme. The PSM uses P(X) to select controls for each of those treated. The Average Treatment Effect of the Treated (ATT) measures the impact of the programme on those individuals who participates, i.e.,

$$ATT = E(Y_1/ D=1) – E(Y_0/D=1).$$

The second term, $E\,(Y_0/D=1)$, is the counterfactual outcome and never observed, but $E\,(Y_0/D=0)$ is an observable outcome. Thus we can calculate

$$\Delta = E\,(Y_1/ D=1) – E\,(Y_0/D=0)$$
$$= E(Y_1/ D=1) – E(Y_0/D=1) + E(Y_1/ D= 1) – E(Y_1 /D=0)$$
$$= ATT + SB \qquad (1)$$

The second term on the right hand side of (1) is the selection bias and the main goal of an evaluation is to ensure that this is equal to zero. Obviously, this will be zero if the comparison group looks like the treatment group in all respects.

Four methods, namely, 'nearest *neighbour*', '*Radius*', '*Kernel*', and '*stratification*' matching methods have been used to measure the average treatment effects of the treated (ATT). Under the '*nearest neighbour*' method, for each treatment unit, we search the control unit with the closest propensity score, i.e., the nearest neighbour. After matching each treatment unit with the control unit, we calculate the differences between the outcome of the treatment unit and the outcome of the matched control unit. The nearest neighbor method is usually applied with replacement in the sense that a control unit can be a best match for more than one treated unit. The ATT of outcome is obtained by averaging these differences. Multiple controls lying within a pre-defined radius are used for a single treatment under the '*Radius*' matching method. The

smaller the size of the radius, the better is the quality of the matches. Under the '*Kernel*' matching method, multiple controls with weight for a single treatment are used where the weight declines with distance. Under the '*stratification matching*' method, the common support of the probability score is divided into several strata. Comparison of treatment and controls is done for each stratum. The ATT here is the average over the different strata.

II. Physical and Financial Progress under SGSY in the Sample District

The sample district was viewed as one of the pioneering states in implementing the SGSY programme by organizing the poor people as well as the women under the SHGs. In fact, undivided Midnapore ranked 1st in terms of total SHGs and 5th in terms of share of women SHGs among all the districts in West Bengal. Table 1 shows that the total number of SHGs formed in the sample district has increased to 52.78 thousand by March 2011 of which 89 percent are formed by the women. Assuming an average group size of 11 members per SHG[3], this translates into coverage of 5.18 lakh women members. It seems that the SHG type organization has become quite acceptable to the women in Midnapore district. However, it also needs mention that while 82 percent of the SHGs in the sample district received Grade-I status, it shows very poor performance in terms of Grade-II SHGs (only 24.8 percent) and project-linked SHGs (6.77 percent). The credit and subsidy components to this programme have been Rs. 47.7 crore and Rs. 33.8 crore respectively during the period 2001-02 to 2010-11. Thus the available information on grading status of SHGs exhibited that actual progress of bank-linkage programme in the sample district is limited to only numerical presentation of the poor people. Though a large number of participants received cash credit[4] as reflected by the number of cash

[3] This is the average size suggested in a recent study by Purushotham (2009, p. 27).

[4] According to the guideline of the SGSY (SGSY Guidelines, MoRD, Government of India, p- 18-23), after around six months of group formation, the SHGs are graded by the banks and the Government officials for judging the eligibility of the group to provide bank credit. Eligible SHGs are allowed to open Cash Credit Account (CC a/c), part of which is contributed by the Government and this part is known as Revolving Fund (R.F) and the other part contains credit provided by banks. Credit limit is determined by the quantum of Revolving Fund and the groups' own savings. Only Grade I passed groups with six months

credit account holder SHGs but a very limited number of SHGs received project loan. Another interesting point in the sample district is that a possession of huge amount Revolving Fund (R.F)[5] by the bank as reflected by the gap between the number of RF receiver SHGs and Cash Credit a/c holder SHGs. The Table 1 shows that as on 31st March, 2011, Revolving Fund disbursed for 3588 SHGs were not disbursed by the different banks operating in the sample district. As per guidelines of SGSY, the R.F assistance is determined on the basis of corpus of SHGs subject to minimum of Rs5000 and maximum of Rs10000. Total revolving fund assistance can go up to Rs 20000 in multiple doses (Annual Report, 2008-09, Ministry of Rural Development, Government of India, p-11). Therefore, the banks kept R.F amounted to Rs 1.79 crore to Rs 7.18 crore in their custody. C & AG's Concurrent Review (2003) also reported that, around 53.54 percent of the SGSY fund was diverted/misused or irregularly spent in India. The reports indicates that in Maharashtra subsidy of Rs 53.91 crore was released in nine districts without ensuring the disbursement of loan by banks (K.G Karmakar et. al; 2008, p-194).

Table 1: Status of SGSY in Midnapore District
(As on 31st March 2011)

Total Number of SHGs (in thousand)	52.78
Percentage of women SHGs	89
Percentage of SHGs having Grade-I status	82
Percentage of SHGs having Grade-II status	24.8
Percentage of Project-Linked SHGs	6.77
Amount of fund utilized during 2003-04 to 2010-11(in crore)	145
% of available fund utilized	82.79
Amount of credit disbursed (in crore)	47.7
Amount of subsidy disbursed (in crore)	33.8
Revolving fund Disbursed to Number of SHGs	41019
Number of SHGs having Cash Credit A/c	37431

Source: DRDA, East Midnapore District and West Midnapore District

experience are supposed to be graded for the second time. After being graded for the second time the groups become eligible for scheme based lending.

[5] SHGs having grade-I have been entitled to receive Rs 10000 as Revolving Fund and it can go up to Rs. 20000 in multiple doses, whereas subsidy have been disbursed only to the groups of Grade-II category on the basis of approval of project proposal by the DRDAs and the Bank. The amount of subsidy for Self-Help groups is 50 percent of project cost subject to maximum of Rs 1.25 lakhs or Rs 10000 per SHG member whichever is less (Annual Report, MoRD, Government of India, 2009-10, pp. 11-12).

With this physical and financial progress of SHG movement under SGSY at a macro-level, it is necessary for us to test the relationship between SHG membership and dependence on formal sources for credit. Does micro-credit membership contribute to reduce the dependence of poor households on informal sources for credit? Does it help to generate sufficient income?

III.Households Dependence on SHG for Credit and Income

Being a member of SHG, the participants can help the households in two ways. Firstly, she can become the supplier of credit/ subsidy to the households or she can generate income by investing credit in any productive activities. In this section, we examined, how much a household depends on micro credit programme for credit as well as income.

Contribution SHG credit to total Credit

The participants of micro credit programme receive cash credit, revolving fund, project loan and subsidy depending on the status of the group. Apart from this, some branches of different banks offer some special loan to the groups.[6] The households of participants meet their additional demand for loan from various institutional and non-institutional sources. The institutional sources include the various commercial, regional and co-operative banks. Non-institutional sources include money lenders, relatives and various private credit supplier agencies (Table 2).[7]

[6] One branch of State Bank of India in Debra Block offer 'Sahajogi loan' to the members of SHGs. Bangiya Gramin Bikash Bank of Nachinda branch of Contai III block and bhogpur branch of Kolaghat block also offer credit to the SHGs before gradation of the group.

[7] Some private agencies, namely, Bandhan, Astha, Asmita etc supply credit to the women of the households in the sample district. Though credit is supplied to individual woman without any collateral but a group of 20-25 women are jointly liable for repayment. Repayment is made weekly and interest rate varies from 15 to 20 percent.

Table 2: Types of Loan Received by the Participants/ Households

Types of loan	Percentage of Respondent of treatment group	Percentage of respondent of control group
i) SHG Bank loan	73.91	
ii)SHG inter group loan	62.99	
iii) Non SHG institutional loan	37.44	12.92
iv) Non SHG non institutional loan	48.95	73.02

source: Primary survey

Households' dependence on various type of loan shows that a sizable number of households received SHG bank loan and SHG internal loan (nearly 74 percent and 63 percent respectively). It is also revealed that relatively higher number of households depends on non-SHG institutional source of credit as compared to that of households of control group, though the situation is reverse for non-SHG non-institutional sources of the credit. It is also to be noted that in spite of participating in the micro-credit programme, nearly one-half of the participants' families depended on the non-institutional sources of credit. However, dependence of the households from the control group on the non-institutional credit is found to be higher (73 percent) compared to the same for those from the treatment group. Thus, it can be said that although participation of the women in the micro-credit programme enhances the dependence of their families on the institutional credit, but the credit obtained from such a source is not sufficient to meet their entire credit requirement.

How does the SHG credit contribute to fulfill the total loan demand of a household? An analysis of size of the SHG loan and contribution of SHG loan to total loan of the families may offer some insights about dependence on informal sources of credit by some households.

To calculate the average size of the SHG loan, information on SHG loan, internal group loan and RF/subsidy amount have been collected for the whole period of membership and average value is calculated by dividing it by the duration of membership (in years). For the non-SHG loan (both institutional and non-institutional), we collected information for the five years preceding the survey and divided it by five.

Table 3: Average Size of Loan/ Funds Received by Participants/ Households by the Age of SHG Groups (in Rs.)

Participation duration	*SHG loan*	*RF/ Subsidy*	*Internal Group loan*	*Non SHG institutional loan*	*Non SHG non institutional loan*	*Total*
i) ≤1 year	314.29	14.28	31.43	2108.57	2301.72	4770.29
ii) > 1year to ≤3years	945.00	198.28	154.41	2480.99	3059.72	6840.50
iii) > 3 years to ≤ 5 years	1056.52	282.46	267.10	1053.59	1901.24	4581.52
iv) Above 5 years	1593.65	305.30	310.37	3378.31	3725.09	9312.71
Total	1169.95	235.47	223.72	2418.78	2412.48	5592.77
Correlation with participation duration	0.35*	0.22*	0.19*	0.09	0.06	

Notes: * implies significant at 1 percent level
Source: Field Survey

It is found that average size of the SHG bank loan, internal group loan and RF/subsidy amount increase with the age of the SHGs in our study areas (Table 3). The sizes of both non-SHG institutional and non-SHG non-institutional loans are twice as large as the SHG loan. It seems that absence of rotation of group- savings as internal loans to the members might have contributed towards the small sizes of the internal loans. We also observed that, in some cases, the SHG members preferred to withdraw their savings and distributed the same among themselves as their own share rather than using that to give internal group loans to their group members. This is reflective of lack of trust among the participants which also limited the opportunity to obtain loans from the banks.

Looking at the contribution of the SHG loan to total loan of a household, we may also gather some idea about the extent of dependence of the households on the SHG loan. The SHG loan includes both cash credit and project loan. For our purpose, we gathered information on credit received from all sources during five years preceding our survey. As shown in Table 4, the SHG loan accounts for more than 50 percent of total loan to a significant number of households (38 percent) that participated in the SHG programme. It is also found that the share of the SHG loan to total loan increases with the age (i.e., duration of participation in the SHG) of the group.[8]

[8] The correlation between percentage of SHG loan to total loan and age of the groups turned to be positive and statistically significant (r = 0.24, p = 0.00).

Table 4 : The Participant Households' Dependence on SHG credit

Contribution of SHG loan to total loan (in percentage)*	*No of Respondents*	*Percentage of households of participants*	*Average duration of participation in SHG (in months)*
i) 0	37	14.34	7
ii) >0 to ≤ 10	26	10.08	53
iii) >10 to ≤ 25	51	19.77	65
iv) >25 to ≤ 50	46	17.83	75
v) > 50 to ≤ 75	29	11.24	58
vi) >75 to ≤ 100	69	26.74	64

Notes:* SHG loan includes both SHG bank loan, internal group loan and some special loan offered to the SHG members by the banks.

Source: Field Survey

The provision of multiple doses of R.F., cash credit and special loan to the matured groups might have caused this positive association between contribution of SHG loan to total loan of the family and the participation duration of the SHG members in the study area. Quite expectedly, long term participation in micro-credit programme make the households of the participants more able to access larger size of institutional credit as old and matured groups are entitled to get larger amount of cash credit and R.F and sometimes banks offer very special loan to the matured groups. But at the same time emergence of non banking financial institutional, which works as micro-bank at customers' door step, enhances the dependence of participants households on them

Thus, it appears that although an overwhelming majority of the members of the micro-credit programme received the SHG credit but the average size of loan and the contribution of SHG loan to total loan of the household are not satisfactory. All these factors explain their dependence on the informal sources of credit. .

Income Generation

The SHG-Bank linkage programme has been designed to help the poor women by providing financial resources like credit/subsidy with the hope that they would use these resources to run the micro-enterprises. Information on uses of the SHG loans can provide some idea about the success of the participating members in this regard. Our field study revealed that, in the sample district, nearly 51 percent of the respondents (recipients of

the SHG loan) invested the loan money either in their own business or in joint ventures with other family/group members. However, it is also found that nearly one-fourth of the respondents handed over their loan money to others to run business. Further, in some cases, loan money is used for non-economic purposes like personal consumption, social ceremonies etc. (Table 5). Our findings here is different from the studies in the context of Bangladesh (Gotze and Sengupta, 1994; Ackerly, 1995; Montgomery, Bhattacharya and Hulme 1996) where, in majority of the cases, the women did not have effective control over the loan money and they just handed over the same to their husbands although they were liable to repay the loans.

Table 5 : Type of Investment of SHG Loan

Investment	*No of respondents*	*Percentage of respondents who received credit*
i) Joint Business with group members	11	5.82
ii) Joint Business with family members	29	15.34
iii) Individual business	56	29.63
iv) Others' business	47	24.87
v) Health	10	5.29
vi) Education	7	3.70
vii Home construction	8	4.23
vii) Marriage or other social ceremonies	2	1.06
ix) Consumption	9	4.76
x) Others	10	5.29
Total	189	100.00

Notes: 189 programme participants received SHG credit/loan which includes only cash credit and project loan.
Source: Field Survey

Generation of income from economic activities depends on types of activities they are involved in along with other factors. So it is important to see where the credit receivers invested their loan to generate income. For this purpose, the respondents, who themselves made investment in their own business or jointly with other family members / group members, were specifically asked about the activities in which they invested their credit. As reported in Table 6, nearly 54 percent of the respondents who themselves made investments invested their loan funds in agriculture and allied activities. For trade and business, the corresponding figure was 28 percent. The agriculture and allied activities mainly includes rearing of livestock and floriculture in our study areas. The women's preference for investment in such low-risk and home-based activities seems to be due to

absence of any high-return economic activity in the area, lack of proper and effective training and lack of market for raw materials and final products.

Table 6: Uses of SHG Loan by the Respondents

Type of activities where members invested their credit	*No of respondents who made investment*	*Percentage of total who made investment*
i) Agricultural and allied activities	52	54.17
ii) Trade and business	27	28.13
iii) Processing	11	11.46
iv) Repair	4	4.17
v) Others	2	2.08
Total	96	100.00

Source: Field Survey

SHG Income

How does the women's participant in the micro-credit programme contribute to their family income? Let us now have a glimpse of size of income generated through investment of credit supplied to the women under the micro-credit scheme. The distribution of the respondents on the basis of income who invested SHG credit in own or joint ventures with other groups is presented in Table 7. The table shows that the monthly income generated through participation in the SHG activities is very negligible (less or equal to Rs. 500 only) for as many as 54 percent of the respondents. Only about 18 percent of the women investors are reported to have attained the income target of the micro-credit programme, which is to earn at least Rs. 2,000 only per month.[9]

Table 7: Income Generation from Investment of SHG Credit

Monthly income generated per group from SHG activity (in Rs.)	*No of Respondents*	*Percentage of total who made investment in productive purposes*	*Percentage of total respondents of the treatment group*
i)0	7	7.29	2.71
ii) 1-200	14	14.58	5.43
iii) 201- 500	31	32.29	12.02
iv) 501- 2000	27	28.13	10.47
v) above 2000	17	17.71	6.59
Total	96	100.00	37.21

Source: Field Survey

[9] The programme intended to bring the poor above the poverty line (expected earnings were set at Rs 22,000 to Rs 24,000 per year during the period of the Tenth Plan (Thekkekara, 2008, 193).

Another important issue here is that the respondents' contribution to their total family income with this small size of SHG income. The contribution of the SHG income (which is generated through investment of SHG loan) to total income of the households is presented in Table 8. For this purpose, we have collected the information on income from all sources and the income from SHG enterprises separately to look into the proportion of SHG income to total family income of those respondents who have invested credit in own/joint ventures.

Table 8: Contribution of SHG Income to Total Income of the Households

Contribution of SHG income to total income (in percentage)	*No of respondents who made investment*	*Percentage of total participants who made investment*
i) 0	7	7.29
ii) ≤ 10	36	37.50
iii) >10 to ≤ 25	26	27.08
iv) >25 to ≤ 50	8	8.33
v) >50 to ≤ 75	14	14.58
vi) >75 to ≤ 100	5	5.21
Total	96	100.00

Source: Field Survey

Distribution of member participants according to the contribution of SHG income to total income reveals that a sizeable number of respondents (nearly 45 percent), who invested SHG credit in own or joint venture, contributed marginally to their total family income (less than 10 percent). Among all SHG loan investors, there were nearly 20 percent SHG loan investors, whose share of SHG income to total family income exceeded more than 50 percent. Factors like small loan size, investment in traditional and low-risk activities etc. might have resulted in such low contribution to their family income after participation in the micro-credit programme. In spite of these limitations, it can be noted that the Government-sponsored micro-credit programme (or the SGSY) in India has achieved successes, especially in terms of its capacity to reduce the dependence on informal sources of credit and to generate income. Credit provision for women is now seen as a powerful tool for institution building at the grass roots level. In these circumstances, it would be interesting to examine how far women have been able to convert this opportunity (i.e., membership of credit organizations) into enhancing their financial contribution to their family income. This is precisely an issue that we intend to

focus in this paper. Specifically, our objective is to examine the income-enhancing capacity of the micro-credit programme. in the next section, we examine the effects of women's participation in the micro-credit programme on their financial contribution to their family income by using the propensity score matching methods.

IV. Propensity Score Matching Estimates for Our Study Areas

Estimating the propensity score is a crucial step in using matching as an evaluation strategy. Though the differences in specification of the model in determining propensity scores have been observed in various studies (Dahejia and Wahba, 1998; Heckman *et al.*, 1997) but the underlying principle is that only those pre-intervention variables that are not influenced by final outcome should be included in the regression. The pre-participation conditions what we considered in this study include some control variables related to the women's demographic and socio-economic status. These are caste of the respondents (CASTE**,** one for general, zero for others), poverty status (POVSTAT, one for members living above poverty line, zero for others), age (AGE, in years), marital status (MARISTAT, one for currently married women and zero for others), education of the respondent (EDURES, measured in years of schooling), family size (FAMSIZE, coded in numbers of family members), education of the head of the family (EDUHEAD, measured in years of schooling), presence of children less than five years old (CHILDREN, one if she had children less than five years old and zero for others), presence of in-laws in respondents' families (INLAWS, one if she stayed with the in-laws and zero otherwise), amount of agricultural land possessed (LAND, in acres), number of adult male members (MADULT) and number of adult female members (FADULT) in the households. Another control variable is the local index (LOCINDEX) constructed on the basis of five local level characteristics in the gram panchayat, which are access to big market, access to road transport, access to bank within the Gram Panchayat, concentration of specific activities in the local area and cooperation of local level implementing agents (organization of meeting of the gram panchayat, initiatives of the resource persons to mobilize the people to form group etc. are considered in this item).

All these items are dichotomous. The Gram Panchayat is assigned value '1' if the average of five local level items is greater than 0.5 and zero otherwise.[10]

It is generally argued that the women's access to credit help them to establish micro-enterprises and thereby generate income. The women's role as supplier of credit as well as financial contributor to the household is expected to enhance their status/position within the households. Therefore, in this section, we attempt to examine the effects of participation on the women's contribution to family income. This variable assumes value '1' if the women contribute to their family income and '0' for others.

A logit regression model has been estimated to compute the propensity score of participation of each individual woman belonging to both the treatment and the control group. Here the covariates are treated as possible predictor variables and the participation variable served as the criterion variable for the model. The results of logit regression, presented in Table 9, reveals that the women who are aged, educated, married and belonged to the general caste category, BPL category, and have large families are more likely to participate in the micro-credit programme. Moreover, the women from the households that have less educated head and possessed lower amount of agricultural land more likely to participate in the micro-credit programme. The presence of minor children and in-laws lowers the probability of the women's participation in the micro-credit programme. Among all these variables, poverty status of the respondent's household, marital status and the education level of the respondents, presence of minor child turned out to be statistically significant.

[10] The women's participation in any development programme may be influenced by the unobserved attitudes and characteristics of other members of the households. Some variables like education of the head of the family, presence of in-laws, number of adult male members and number adult female members in a household are used in the model as proxies to adjust the unobserved attitudes and characteristics of the household members. The objective of the inclusion of these variables was to remove bias, at least partly, that arises due to selection of unobservable.

Table 9: Results of the Logistic Regression (Participation on Women's financial Contribution to Family Support)

Covariates	*Coefficient*	*Standard Error*	*z' value*
LOCINDEX	-0.15	0.24	-0.64
CASTE	0.12	0.27	0.46
POVSTAT	-0.93	0.24	-3.82*
AGE	0.01	0.01	1.00
MARISTAT	0.79	0.46	1.73***
EDURES	0.33	0.04	7.36*
FAMSIZE	0.18	0.12	1.51
EDUHEAD	-0.004	0.04	-0.13
CHILDREN	-1.05	0.3	-3.51*
INLAWS	-0.58	0.33	-1.75
LAND	-0.04	0.22	-0.20
MADULT	-0.15	0.17	-0.90
FADULT	0.12	0.26	0.47
Constant	-2.83	0.84	-3.36*
No of observations	455		
No of treatment	258		
No of control	197		
Pseudo R^2	0.24		
LR $Chi^2(13)$	147.69*		

Note: * and *** imply the 1 and 10 percent levels of significance respectively.
Source: Field Survey

The propensity score is calculated for each individual woman with the help of above estimated logit regression model. The propensity score represents the probability that the individual woman would be a member of the treatment group. The region of common support is determined by ranking all observations according to their propensity score. In our study, the region of common support has been derived as (0. 05848802, 0.99063855. Four observations fell outside the region of common support. Therefore, the balancing tests for covariates have been conducted using 451 observations (Appendix Tables 1A, 2A, and 3A).

After estimating the propensity score, for the treated and the comparison group, we plotted them to check the common support condition. Based on Table 1, the mean propensity score for the participants is computed as 0.695 (with a standard deviation of 0.209). This is of course much higher than that for the non-participants which is 0.406 (0.242). However, there is a complete overlap in support. We found that not a single non-

participant is having a score less than the lowest value for the participants, suggesting that there is considerable eagerness among the women to participate in the micro-credit programme.

Table 6.10: Treatment Effect of Participation on Women's Financial Contribution to Family Support

	Nearest Neighbor	*Kernel*	*Radius*	*Stratification*
ATT	0.24	0.21	0.17	0.20
Standard Error	0.09	0.08	0.05	0.06
't" value	2.64*	2.73*	3.22*	3.15*
No of Treatment	258	258	254	258
No of Control	88	193	193	193

Note: * implies 1 percent level of significance.
Source: Field Survey

The results obtained from the PSM exercise with participation in the micro-credit programme as treatment variable are presented for the women's financial contribution to their family income in Table 10. This table actually gives our estimates of average gain in term of the women's financial contribution to their family. To estimate this, we first estimated the gain of each participating woman by all the four methods described in section 2 above. The nearest neighbor estimate of the ATT is found to be 0.24, which is highest among all other methods. For Kernel, radius and stratification matching the corresponding figures are 0.21, 0.17 and 0.20 respectively. Comparing the standard errors for the four estimators, it is found that the precision of the estimators gets improved as we move from the nearest neighbor matching to other methods of matching. However, the difference in the standard errors between the nearest neighbor and the Kernel matching methods is 27 percent. Thus, there is an improvement in precision of estimators when we resort to 'm to 1' matching with 'm>1', the improvement is only modest compared to the increase in the number of matches. The positive ATT in this domain implies that the more women in the treatment group are likely to contribute to their family as compared to the members of the control group. This indicates that the participation of the micro-credit programme enhances the women's participation in income earning activities and thereby more women contribute to their family income.

V. Concluding observations

A glance into the percentage of households received credit under different sources shows that though an overwhelming majority of the households of member participants received SHG bank loan and SHG internal group loan, but a sizable proportion of the households participating in micro-credit programme also depend on informal sources of credit. However, this percentage goes up further in case of non-participating households. Percentages of households of member participants dependent on non-SHG institutional loan was found to be three times higher than that of households of the members of the control group. Dependency on both non-SHG institutional loan and non-SHG non-institutional loan by the participant respondents could be attributed to the small size of SHG loan and emergence of non banking financial institutional in the study area, which works as micro-bank at customers' door step, enhances the tendency of participants households on them. .

As regards investment of SHG credit, it is found that majority of SHG loan receivers (nearly 51 percent) invested their loan amounts either in own business or in joint business with other group members and family members and investment in SHG loan was mainly limited to agricultural & allied activities followed by business and trade in the study area. Moreover, the income generated from SHG activities is very negligeable (Rs 0- Rs 500) for a vast majority of programme participants (nearly 54 percent). Small size of SHG loan, investment in traditional economic activity, small income could be attributed to the low financial contribution to family support by the programme participants in the study area.

The ATT of participation in the micro-credit programme turned to be positive and statistically significant for all matching methods. Moreover, the precision of matching impact estimators does improve when we use multiple controls instead of one control of matching.

This suggests that the participation in the micro-credit programme can contribute to the achievements of reducing the dependence on informal sources of credit, helps to generate income and involve the women in income earning activities and to generate income.

REFERENCES

Ackerly, B. A (1995),'Testing the Tools of Development: Credit Programmes, Loan Involvement and Women's Empowerment', *IDS Bulletin*, Vol. 26, No. 3, pp. 56-68.

Dehejia, R. H, and S. Wahba (1998), 'Propensity Score Matching Methods for Non-experimental Casual Studies', NCER Working Paper 6829, Cambridge, MA.

DRDA (2011), Report on 'Physical and Financial progress of SGSY', District Rural Development Agency (DRDA), West Midnapore, West Bengal, India.

DRDA (2011) Report on 'Physical and Financial progress of SGSY', District Rural Development Agency (DRDA), East Midnapore, West Bengal, India.

Goetz, A. M., and R. Sen Gupta (1994*),* '*Who* takes the credit? Gender, Power and Control over Loan Use in Rural Credit Programmes in Bangladesh', *World Development*, Vol. 24, No. 1, pp. 45-63.

Government of India (2008-09), *Annual Report*, Ministry of Rural Development, New Delhi

Government of India (2010-11), *SGSY Guidelines*, Ministry of Rural Development, New Delhi.

Hashemi, S M, S. R. Schuler, and A P Riley (1996), 'Rural Credit Programmes and Women's Empowerment in Bangladesh', *World Development*, Vol. 24, No. 4, pp. 635-653.

Heckman, J, H. Ichimura, and P. Todd (1997), 'Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme', *Review of Economic Studies,* Vol.64, pp. 605-654.

Heckman, J, H. Ichimura, J. Smith, and P. Todd (1997), 'Characterizing Selection Bias using Experimental Data', *Econometrica* , Vol. 66, No. pp. 1017-1099.

.

Karmakar, K G (ed.) (2008), *Micro-Finance in India*, Sage Publications, New Delhi.

Montgomery, R., Bhattacharya, D, and Hulme, D (1996), 'Credit for the poor in Bangladesh', in D. Hulme, and P. Mosley (eds.), *Finance Against Poverty*, Routledge, London.

Padia, V (2005), 'Social Mobilization and Micro-credit for Women's Empowerment: A Study of DHAN Foundation', in N Burra, J D Ranadive and R K Murthy (eds.), *Micro-Credit, Poverty & Empowerment,* Sage Publications, New Delhi, pp. 161-199.

Parthasarathy, S. K (2005), 'Awareness, Access and Agency: Experiences of SwayamShikshanPrayog in Micro-finance and Women's Empowerment', in N Burra, J D Ranadive and R K Murthy (eds.), *Micro-Credit, Poverty & Empowerment,* Sage Publications, New Delhi, pp. 200-244.

Pitt, M, and Khandker, S (1998), 'The Impact of Group Based Credit Programmes on Poor Households in Bangladesh: Does the Gender of Participants Matter?' *Journal of Political Economy*, Vol. 106, No. 5, pp. 958-996.

Purushotham, P (2009), *Institutional Credit for Rural Livelihood: A Study of SGSY in the Regions of High Poverty*, NIRD, MoRD, Government of India.

Rusenbaum, R, and D Rubin (1983), 'The Central Role of the Propensity Score in Observational Studies for Casual Effects, *Biometrica* , Vol. 70, pp. 41-55

Rajivan, A (2005), 'Micro-Credit and Women's Empowerment: A Case Study of SHARE Micro- finance Limited', in N Burra, J D Ranadive and R K Murthy (eds.), *Micro-Credit, Poverty & Empowerment,* Sage Publications, New Delhi, pp. 116-160.

Sharma, H. R (2008),'Functioning and Impact of Microfinance: Evidence from Himachal Pradesh', in S. K. Bhaumik (ed.), *Reforming Indian Agriculture,* Sage Publications, New Delhi, pp. 269-290.

Thekkekare, F. T (2008), 'Impact of SGSY on SHG: Bank Linkages', in K.G. Karmakar(ed.), *Microfinance in India*, Sage Publications, New Delhi, pp. 188-218.

Appendix Table

Table 1A: Distribution of Treated and Controls Across Blocks(Participation on Women's financial Contribution to Family Support)

Blocks of Propensity score	*Control Group*	*Treatment Group*	*Total*
1	51	7	58
2	53	22	75
3	41	42	83
4	33	82	115
5	15	105	120
Total	193	258	451

Source: Field Survey

Table 2A: t- Test for Equality of Propensity Score Across Blocks (Participation on Women's financial Contribution to Family Support)

Blocks of Propensity score	*Control Group*		*Treatment Group*	
	Mean	*Standard Dev.*	*Mean*	*Standard Dev.*
1	0.13	0.01	0.13	0.02
2	0.30	0.01	0.30	0.01
3	0.49	0.01	0.51	0.01
4	0.69	0.01	0.71	0.01
5	0.87	0.01	0.87	0.01

Source: Field Survey

Table 3A: Balancing of Covariates Across Blocks(Participation on Women's financial Contribution to Family Support)

Blocks		*Control Group*		*Treatment Group*	
		Mean	*Standard Dev.*	*Mean*	*Standard Dev.*
1	CASTE	0.43	0.50	0.71	0.49
	POVSTAT	0.55	0.50	0.43	0.53
	AGE	36.59	12.83	31.28	9.34
	MARISTAT	0.61	0.49	0.71	0.49
	EDURES	1.02	1.45	1.43	2.07
	FAMSIZE	4.20	1.92	4.00	1.53
	EDUHEAD	3.10	3.42	3.86	2.73
	CHILDREN	0.45	0.50	0.57	0.53
	INLAWS	0.27	0.45	0.43	0.53
	LAND	0.21	0.52	0.50	0.36
	MADULT	1.27	0.94	1.29	0.76
	FADULT	1.53	0.76	1.43	0.79
	LOCINDEX	0.67	0.48	0.71	0.49
2	CASTE	0.60	0.49	0.59	0.50
	POVSTAT	0.38	0.49	0.36	0.49
	AGE	37.11	11.46	34.91	6.18
	MARISTAT	0.91	0.30	1.00	0.00
	EDURES	2.43	2.42	2.23	2.05
	FAMSIZE	4.47	1.46	4.91	1.34
	EDUHEAD	4.34	3.47	4.68	4.19
	CHILDREN	0.21	0.41	0.23	0.43
	INLAWS	0.42	0.50	0.45	0.51
	LAND	0.35	0.53	0.3	0.3
	MADULT	1.53	0.70	1.54	0.67
	FADULT	1.62	0.63	1.72	0.63
	LOCINDEX	0.6	0.49	0.72	0.46
3	CASTE	0.83	0.38	0.81	0.40
	POVSTAT	0.44	0.50	0.52	0.51
	AGE	32.78	9.70	33.74	8.01
	MARISTAT	0.98	0.16	0.88	0.33
	EDURES	5.49	2.50	5.83	2.51
	FAMSIZE	4.71	1.87	4.40	1.29
	EDUHEAD	6.41	3.46	6.50	3.09
	CHILDREN	0.37	0.49	0.26	0.45
	INLAWS	0.37	0.49	0.29	0.46
	LAND	0.34	0.60	0.38	0.41
	MADULT	1.68	0.93	1.60	0.83
	FADULT	1.56	0.74	1.55	0.74
	LOCINDEX	0.61	0.49	0.57	0.50

6.8A Continued

Blocks		*Control Group*		*Treatment Group*	
		Mean	*Standard Dev.*	*Mean*	*Standard Dev.*
4	CASTE	0.82	0.39	0.73	0.45
	POVSTAT	0.27	0.45	0.34	0.48
	AGE	33.36	8.04	34.33	7.60
	MARISTAT	0.97	0.17	0.98	0.16
	EDURES	7.12	1.92	7.70	1.82
	FAMSIZE	4.82	1.96	5.15	1.79
	EDUHEAD	6.55	3.62	6.93	3.42
	CHILDREN	0.18	0.39	0.23	0.42
	INLAWS	0.36	0.49	0.44	0.50
	LAND	0.47	0.60	0.48	0.61
	MADULT	1.76	0.94	1.85	0.94
	FADULT	1.61	0.74	1.80	0.73
	LOCINDEX	0.67	0.48	0.67	0.47
5	CASTE	0.73	0.46	0.80	0.40
	POVSTAT	0.27	0.46	0.13	0.34
	AGE	34.60	9.04	36.48	6.97
	MARISTAT	1.00	0.00	0.98	0.28
	EDURES	10.07	2.49	9.82	2.21
	FAMSIZE	5.53	2.88	4.94	1.72
	EDUHEAD	9.53	4.69	9.16	3.74
	CHILDREN	0.13	0.35	0.06	0.23
	INLAWS	0.40	0.51	0.30	0.46
	LAND	0.68	1.40	0.51	0.64
	MADULT	2.13	1.25	1.97	0.92
	FADULT	2.00	1.31	1.68	0.83
	LOCINDEX	0.67	0.49	0.56	0.50

Source: Field Survey