# Effectiveness of Microfinance under SGSY scheme to reduce Poverty and Vulnerability of Rural Households: A Natural Experiment

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# EFFECTIVENESS OF MICROFINANCE UNDER SGSY SCHEME TO REDUCE POVERTY AND VULNERABILITY OF RURAL HOUSEHOLDS: A NATURAL EXPERIMENT

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**ABSTRACT**

This paper shows that government of India supported microfinance programme under SGSY scheme is partially effective to reduce poverty of the rural households. Few expansion of National Rural Employment Guarantee scheme plays here the supportive role. Taking the help of Natural Experiment it is also proved that microfinance programme is also able to reduce vulnerability of the rural participating households. This is done through constructing vulnerability index. The social factor i.e. enhancement of empowerment of the participating Self-Help Group members all of whom are women under SGSY scheme between the concerned time period and size of microcredit taken for income generating activities plays a significant role to reduce vulnerability of the participating households of this microfinance programme.

Key words: Microfinance, SGSY Scheme, Poverty, Vulnerability, Natural Experiment

JEL Classifications: G21, R38, I38.

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**Introduction**:

Monthly income or monthly per-capita consumption expenditure (MPCE) is generally considered as indicators for the material well-being of a household in any economy. But in actual practice a household's well-being depends not only on the above two indicators but risk also plays an important role in determining well-being particularly among those households with small financial resources. So the concept of vulnerability has arisen during the time of explaining the well-being of a household. Vulnerability is defined as the risk that a household who is currently not poor may face and will fall below the poverty line or that a household that is currently poor will become poorer. Thus vulnerability can usefully be distinguished from the concept of poverty which is ex-post measure of a household welfare (Chaudhury et.al. 2002). A household will be vulnerable if it is unable to manage any idiosyncratic risk and shock due to inadequate assets and social protection mechanism. Actually the poor households are extremely vulnerable because they have little opportunity to manage risk. Even a small decline in welfare could be life-threatening or would at least have permanent consequences for human capital. The vulnerable includes not only those who are already poor but also those currently just below or above the poverty line who are potentially subject to severe shocks and have little ability to manage risks. Present literature has mentioned two forms of vulnerability: (i) vulnerability as expected poverty (VEP) and (ii) vulnerability as expected low utility (VEU). VEP was first approached by Chaudhuri et.al (2002) where vulnerability is considered as the probability that a household will fall below the poverty line in future. Here poverty is measured in terms of consumption. Ligon and Schechter (2003) have defined vulnerability as the sum of three components: poverty, aggregate risk and idiosyncratic risk. According to them minimization of vulnerability means maximization of expected utility. Vulnerability is prevalent in rural low income households the magnitude of risk they face is striking. Actually vulnerability of a rural household should be expressed as uninsured exposure to risk. Rural people of the underdeveloped countries face these types of risk both at macro as well as micro level. Shocks at macro level are floods, drought epidemics, erosion of top soil, lowering water level etc. Micro level shock generally faced by the rural households are sudden illness, destroy of house, loss of

job or lack of getting sufficient employment in the rural sector etc. Unexpected loss due to illness, death is anticipated given health related environment and poor medical services they face. Both types of shocks lead to substantial loss of income, wealth and consumption. Social protection is necessary for a household to overcome risk. Microfinance system can be treated as an important instrument for providing social protection for the poor mainly the individuals who are living in rural areas. So the implementation of microfinance programme as a social protection tool for the rural poor may help the rural households to reduce their vulnerability. Government of India has initiated microfinance program among rural women under SGSY scheme through group-lending system. Microfinance helps the poor households to meet basic financial services such as savings and getting credit during the time of distress. The credit can be utilized as working capita for initiating or expanding any income generating activity which can provide economic stability of the micro borrowers. Microfinance programme generally targeting poor village women by providing financial services only through women; making women responsible for repayment of loan and doing savings habit regularly and playing an important role to improve household economics. Microfinance group members periodically contribute savings that are used to build a revolving fund from which they are encouraged to borrow to meet their consumption and short-term production needs. Access to consumption credit enables them to strengthen income-generating activities. SGSY scheme wants to provide self-employment and sustainable increase in the income of the poor. It adopts a group approach, working through a cluster of villages and the formation of self-help group. Crucial to the success of the programme is social mobilization of the poor, organizing them into self-help groups, motivating them and building their capacity for development.

Poverty is reflected through low level of income as well as lower value of MPCE. But the real cause of poverty is lack of knowledge, skill and capabilities. It is told that most of the poor, especially the ultra poor is very unlikely to have the knowledge and the capabilities to run a business and able to encounter the complexities of running a business, even a small one. It is true that microcredit can not solely play an important role to reduce poverty. The provision of credit must be followed by another development programme which can help the poor to utilize the credit properly. So government of India has initiated National Rural Employment Guarantee Scheme (NREGS) whose basic objective is to generate non-farm employment among the poor rural households throughout the year and arrange at least 100 man-days of employment annually.

This not only helps the poor rural households to get employment in the non-farm sector but also plays a significant role to generate asset in rural locality. Actually proper implementation of NREGS helps the rural households to enjoy few positive externalities. This is another type of social protection mechanism which can cope with any idiosyncratic risk among the poor rural households. Basic objective of this paper is to investigate whether microfinance programme under SGSY scheme is able to reduce poverty and vulnerability of the participating rural households when the rural households are also enjoying few benefits of NREGS directly and indirectly.

This paper is divided in to five sections. In Section-1 we shall discuss about the operating procedure of microfinance programme under SGSY scheme, in Section-2 we shall give brief review of related literature, in Section-3 we shall give information about data collection and methodology we have taken, in Section-4 we will discuss about the effectiveness of the microfinance under SGSY scheme to reduce poverty of rural households, in Section-5 we shall discuss about the effectiveness of the above microfinance programme to reduce vulnerability of rural household after constructing vulnerability index and the factors which may play the leading role to reduce that vulnerability.

**Section-1: Operating Procedure of Self-Help Group under SGSY Scheme**:

Central Government in his poverty alleviation programme has initiated microfinance programme under Swarnajayanti Grameen Swarojgari Yojana (SGSY) with the help of local panchayet and District Rural Development Agency (DRDA). The programme is motivated by the concept of joint liability microcredit contract. Each self-help group (SHG) under SGSY scheme generally consists of not more than 15 members. The members are almost homogeneous in nature and they belong to almost same socio-economic background. It is operating like ROSCA (Besley, Coat, Loury, 1993). Self Help Group is formed by the intended participants. They initially have to contribute a minimum amount in their respective groups regularly and on monthly (and sometimes on weekly) basis. The total collected amount is deposited in to nearby commercial bank. Each group has a group leader and a treasurer who are selected democratically by the group members. After accumulation of certain amount of group corpus, a member can take credit from the group she belongs. At the time of demanding loan she has to explain clearly in which purpose loan is required for her. If her explanation satisfies other group members, then only loan

is granted where written consent of all the members is necessary. The credit has to be repaid within stipulated time period. Most of the times, the rate of interest is 2% per month. After six months of group formation, the commercial bank, DRDA officials and a representative of the panchayet will examine the performance of the group. If it is satisfactory, then that group will be qualified as Grade-1. After that, the group can get refundable financial help from DRDA and cash credit from commercial bank. Cash credit given by the attached Commercial bank has to be paid with interest but the credit given through DRDA is interest free. The above mentioned two credits is a function of the accumulated group corpus of the group prior to gradation test. These two credits help the group to disburse larger amount of credit among the group members which ultimately help them to expand existing business or initiate new business or can utilize that for any other purposes just like houserepairing or for medical treatment avoiding the crunches of the professional money lenders. Any of the above action taken by the borrowing member can improve or stabilize their economic well-being and reduce vulnerability of the member household. In this type of microfinance system, the loss of social recognition and self-esteem for non-repayment of loan are two important instruments to avoid moral hazard problems. So we observe high repayment of loan in these types of microfinance system.

**Section-2: Over view of Literature:**

Graham A.N. Wright *et.al***.** (1999) in their study in Uganda had observed that financial services through microfinance system under joint liability can reduce vulnerability of the poor individuals and households by providing access to money to protect against risk and cope with shocks. According to them, building of women's human asset like self-esteem, bargaining power, control over household decision and skill improvement programme can help the rural households to reduce their vulnerability. Almost same type of observation was done by Cohen (1999). She observed that microfinance service is helping the rural participating households to protect against risk ahead of time. Swain and Floro (2008) on the basis of longitudinal data found out that SHG member have lower vulnerability as compared to a group of non-SHG members.

**Section-3: Data and Methodology:**

To investigate the above research problem we shall have to depend on Natural Experiment. The technique of 'Natural experiment' is applied to study the impact of any economic policy mainly

taken by the government. It is expected that a policy changes some economic indicators of a particular group of people where it is implemented. The basic idea of 'Natural Experiment' is to compare the reaction of group affected by the change of those of another group having similar characteristics but is untouched by the change. The first group is called 'Treatment group' and the second group is called the 'Control group'. Within the framework of natural experiments the effect of a change due to implementation of economic policy is most often assessed with the help of first difference method. This method is based on 'panel data of two periods. The basic objective is to use the two period data is that the presence of common effect from both observable and unobservable factors can be removed through modeling the differences between the outcomes of the two period primary data.

We have chosen Patharpratima block of South 24 Parganas district of West Bengal randomly. The district itself is a backward district and the block we have chosen is a remote block and very near to Sunderban. In that block we have chosen four out of ten gram panchayets randomly and those are Digambarpur, Dakhin Raipur, Sridharnagar and Ramganga. We know the presence of more than one village under each Gram panchayat and the randomly chosen sample villages are, Digambarpur, Madhabnagar of Digambarpur Gram Panchayet, Dakhin Raipur and Piprekhali in Dakhin Raipur Gram Panchayet, Sridharnagar and Rakhalpur in Sridharnagar Gram Panchayet and Ramganga and Debichak of Ramganga Gram Panchayet. From each village we have to draw samples of two types of individuals, (i) the member of any Self-Help Group under SGSY scheme and (i) the non-member sample respondents who are not members any SHG under SGSY scheme or any other type of microfinance system but from almost homogeneous economic background and have the eligibility criterion to join in the microfinance system. Initially we have to identify the Self-Help Groups which have formed between April to July 2007 under SGSY scheme because that time period is here considered as baseline period (identified as $t_0^{th}$ period) of our natural experiments. We here take the help of two stage sampling. We have found 18 such groups. From each group we have chosen 7 members randomly. So total sample size of the SHG members has become 126. During the time of drawing sample belongs to control group we have initially identified the respondents who have not yet joined under SGSY scheme. After that we have to investigate whether that respondent belongs to the household almost identical economic condition that of treatment group. If that is 'yes' then we have chosen that sample respondent belongs to control group. We were vey careful during the time of selection of control group. This

selection procedure helps us to reduce the possible heterogeneity between the participants of SGSY scheme and the non-participants. In this way we want to moderate the impact of the selection bias in our experimental framework. Total final sample size in our paper is 237 out of which total respondents who had joined under SGSY scheme is 126 and total respondents belong to control group is 111[1].

The impact is felt by a 'typical' person who gains access to a microfinance programme. We want to investigate what was the socio-economic condition of the sample households both belong to treatment group as well as control group prior to April to July 2007 after considering previous one year as reference year and what is the present picture of the same households after 2 and half years. So in our investigation the 'end line' period required for before versus after comparison is September-December 2009 (which is denoted here as $t_2$). Microfinance impact requires comparing the values of the outcome variable between $t_2^{th}$ and $t_0^{th}$ period of the treatment group with that of the control group. In this paper 'Change of Vulnerability Index' is considered the outcome variable.

**Section-4: Impact on poverty**:

In the under developed countries there is a large concentration of people living on either side of the poverty line. The spectrum of poor people can be divided into three distinct groups, the extreme poor, the moderately poor and the vulnerable non-poor. The third group of 'vulnerable non poor' is not counted in the official statistics, but it constitutes that a large percentage of the future poor or the individuals who at any time may go down to the poverty line. Sustainable livelihood and reduction in the incidence of poverty among those individuals are to be achieved through policy interventions and social protection mechanism. Traditionally the main purpose of social protection has been to reduce poverty. Microfinance programme of the Government of India under SGSY scheme is a social protection mechanism for the poor. Now the question is whether this microfinance programme helps the rural poor households to stay out of poverty. The Expert group of Planning Commission had calculated rural poverty line of West Bengal on the basis of mixed reference period and that was Rs.445 in 2004-05. To calculate the rural poverty line of West Bengal in the baseline period i.e. April-July 2007 of our investigation we have to

[1] Here it has to be remembered that both types of sample households enjoy the benefit of NREGS directly or indirectly. So the problem of sample selection bias is minimized.

calculate the adjusted rural poverty line on the basis of Consumer's Price Index of Agricultural Labourers of West Bengal and that became Rs.511 MPCE. The adult equivalent per capita consumption expenditure of the sample respondents both belong to treatment group as well as control group in the $t_2^{th}$ period i.e. in the 'end line' period has also converted in to baseline period i.e. $t_0^{th}$ period on the basis of Consumer's Price Index of the agricultural labourers of West Bengal[2]. Now comparing the two time periods we can have the following picture expressed in Table-1.

Table-1: Distribution of the Sample Households in terms of Adult Equivalent Monthly Per-Capita Consumption Expenditure

| MPCE (Rs.) | SGSY Members | | Non-Members | |
|---|---|---|---|---|
| | $t_0$ period | $t_2$ Period | $t_0$ Period | $t_2$ Period |
| 0 - 250 | 42 | 26 | 35 | 25 |
| 251 - 400 | 38 | 31 | 26 | 36 |
| 401 - 511 | 31 | 30 | 39 | 37 |
| 511 - 600 | 10 | 34 | 06 | 08 |
| 600 & above | 05 | 05 | 05 | 05 |
| Total | 126 | 126 | 111 | 111 |

Source: Calculated by author

The above picture shows that in the $t_0^{th}$ period i.e. just before joining Self-help Group under the SGSY scheme 111 of 126 belong to treatment group 100 out of 111 belong to control group were lying below the rural poverty line of West Bengal. But in the $t_2$ period 87 out of 126 sample

[2] In order to calculate the MPCE of the sample households in both the periods we initially have calculated the annual income of the sample households from different occupations. Then we have to convert that in to average monthly income. Now we have to take information about average monthly savings of the sample households both in the group and outside. Besides that we also have taken information of any amount required to repay any loan. Subtracting that sum total from average monthly income we have got average total monthly consumption expenditure of the sample households. Dividing that by adult equivalent number we can get MPCE of the sample household both belongs to treatment group as well as control group in both the periods. To get accurate result we have also calculated that from expenditure side on the basis of mixed reference period as taken by NSSO recently. If the difference is not more that Rs.50 then we consider the latter figure. But if it is observed that the difference is more than Rs.50 then we consider the result calculated on the basis of initial method because the sample households can give more clear information on income rather than expenditure.

households belong to treatment group and 98 out of 111 sample households belong to control group were still lying below the adjusted rural poverty line of West Bengal. So 24 rural households belong to treatment group were able to cross the poverty line between the concerned time period after joining microfinance programme under SGSY scheme. But only 2 households belong to control group were able to cross the poverty line between the concerned time periods. Besides that acuteness of poverty[3] has also declined among the Self-Help Group members. Actually getting employment through NREGS and taking microcredit for income generating activity mainly for agricultural purposes help the member rural households to do that. The expansion of NREGS has helped the rural households both directly as well as indirectly. Directly the member households most of whom are in regular touch with the local panchayet were able to get job on an average 30 to 35 man days between September-December 2008 to September to December 2009. Here both male and female members are able to get job under NREGS which automatically help them to improve their earnings. Besides that lots of river dams were constructed under NREGS in the sample villages which protected the villages from flood which was almost common the sample villages in 2006 and that flood had affected the agricultural land. So it became difficult for the marginal farmers to cultivate that in the winter or in boro season. Now the agricultural lands are much more protected and marginal farmers have now started to cultivate land in the winter or boro season after taking microcredit from their respective group which also helps them to earn more from their agricultural land even after repaying credit. Few brick roads were also constructed through NREG scheme which is now helping the small and marginal farmers to sale their crop outside the village which also helps them to get better price of crop. The area was attacked by storm AILA in May 2009. But this 'macro level' high shock does not create much impact on cultivation and other economic activities of those villages like fishing and mainly the consumption pattern of the villagers. So influence of microcredit programme under SGSY scheme supported by NREGS help the rural households mainly the member households to reduce their poverty.

**Section-5: Impact on Vulnerability**:

The outcome-based measures are not without problems. The information requirements are high and no straightforward measurement is possible on the basis of primary data. So to do the impact

[3] Acuteness of poverty is observed among those households whose MPCE is less than Rs.250.00

study we have to depend on data for changes of outcome and possible reasons of that changes which we can only get through longitudinal data of two periods collected directly from field survey. So we have taken the cross section data of a group of households both belonging to control group and treatment group of two separate periods. We have already mentioned that $t = t_0$ is for base line period and $t = t_2$ as 'end line' time period. To remove the unobserved heterogeneity we assume that the omitted variables do not change over time and we have to use the fixed effect on first-differencing method. We can write a model with a single observed explanatory variable as

$$Y_{it} = \beta_0 + \delta_0 d2t + \beta_1 X_{it} + a_i + u_{it} \text{ when } t = t_0 \text{ and } t_2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

In this model d2t is the dummy variable which equals to zero when $t = t_0$ and one when $t = t_2$. Therefore the intercept at $t = t_0$ is $\beta_0$ and at $t = t_2$ is $\beta_0 + \delta_0$. The explanatory variable $a_i$ is generally called unobserved effect. To remove the unobserved effect we can difference the data across the two years. If we subtract the second equation i.e. the situation when $t = t_2$ from the first equation when $t = t_0$ we have the following equation

$$(Y_{i2} - Y_{i1}) = \delta_0 + \beta_1 (X_{i2} - X_{i1}) + (u_{i2} - u_{i1})$$

Or

$$\Delta Y_i = \delta_0 + \beta_1 \Delta X_i + \Delta u_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Here '$\boldsymbol{\Delta}$' denotes the changes from $t_0$ to $t_2$. The above equation is called the first differenced equation. It is just a single cross section equation. The most important is that $\boldsymbol{\Delta} u_i$ is un-correlated with $\boldsymbol{\Delta} X_i$.

The equation (1) can be written in the following form.

$$\Delta VI_i = \delta_0 + \alpha_1 D_1 + \alpha_2 \Delta EMP_i + \alpha_3 \Delta DRatio_i + \alpha_4 \Delta CRIGA_i + \alpha_5 \Delta CRNIGA_i + u_i \ldots\ldots (2)$$

In the above equation the dependent variable is $\Delta VI_i$ which is actually the change of the value of calculated vulnerability index of the $i^{th}$ sample household between the $t_0^{th}$ and $t_2^{th}$ period. We know that vulnerability is a multidimensional concept based on both monetary and non-monetary concepts. A number of welfare indicators can be used to measure vulnerability of a rural household. Here we propose a simple definition of what we term vulnerability and a simple technique for identifying vulnerable population.

In this present paper 'Vulnerability Index' is measured on the basis of five point scale (1-5). Lower the value of vulnerability index, low will be the vulnerability of that rural household. To construct vulnerability index of the rural households we have to depend on the following components:

**(i)** **Asset**: Both physical and financial assets are useful to protect vulnerability of the rural household. They also should be liquid and maintain their values during crises. Assets in general are likely to assist the ability to cope any idiosyncratic risk. But much attention will have to be paid on whether they can actually be mobilized when idiosyncratic or common shocks occur. This includes both productive as well as durable assets. We also know that greater the value of asset, higher will be the credit worthiness of the household. In the rural areas less poor (e.g. the better-off among poor households) are generally those who own a small plot of productive agricultural land. Ownership of land help the rural household to cultivate necessary crops mainly rice in their own field with the help of family labour force which help that household to maintain subsistence level of consumption if the major part of the produced crop is used for self consumption. Cultivatable land always has a good market value[4] and that can be sold to absorb the shock of any idiosyncratic risk. We know that homelessness and lack of homestead plot makes people more vulnerable. So during the time of calculating vulnerability index we have to consider whether the sample household has any homestead or not. If 'yes' then she or any of the other family member is asked about the approximate value of the house she or any other family member owns. In our survey region it came out from our field survey that near about 50% of the member households are living in their own house. Sometimes they also took loan for house repairing. But most of the houses they own are cottages with ceiling made by straw or earth tiles. Durable assets like Cycle, T.V. Farm equipments can be sold easily to avoid any 'micro level' idiosyncratic risk like illness of any family member. Ownership of durable assets is also considered during the time of calculating

[4] The value of land in our survey area was Rs.45000 per bigha i.e. one third of acre in the base period but that price is increased up to Rs.55000 to 60000 per bigha in the current period. All the values of land mentioned above are nominal values. But during the time of calculating vulnerability index we have to convert the nominal values in to real terms considering 'base line period' as base period.

Vulnerability Index. Households with fewer assets or no asset will be automatically much vulnerable.

**(ii)** **Savings**: One of the basic objectives of a microfinance programme is to generate savings habit among the rural poor. Savings always play an important role to reduce vulnerability of the household. Accumulation of savings has a greater impact on the household in the long run. If the household has sufficient savings then he can avoid or tackle any type of idiosyncratic risk. So higher the size of accumulated savings, lower will be the vulnerability of the rural household. Here, we have to remember that the size of accumulated savings does not include compulsory savings of the participants of the microcredit programme in their respective group. Most of the times the rural households save either in bank or in post offices. Here during the time of calculating the index we have considered previous one year both of 'baseline' period and 'end line period' as reference period. It came out from the field survey that most of the samples households belong to treatment group as well as control group are not economically solvent even in the $t_2^{th}$ period. So less weight is given on accumulation of savings during the time of calculating Vulnerability Index.

**(iii)** **Monthly Per-capita Consumption Expenditure**: In India, poverty line is expressed as monthly per-capita consumption expenditure (MPCE). So during the time of calculating Vulnerability index we have to incorporate MPCE of the sample households both belong to treatment group as well as control group. Higher MPCE automatically claims as an important component during the time of calculating Vulnerability Index because high MPCE means the household is able to place them above poverty line and is almost capable to maintain that.

**(iv)** **Share of wage to total average monthly income of the household**: Earning members of the rural households are generally working either in rural or urban informal sector and mainly depend on wage income. So if the share of wage component of the rural household in his total average monthly income is high more likely it is that such rural household is relatively less income secure and may be

forced to borrow more and frequently which indicates the household is more vulnerable[5].

**(v)** **Causes of loan taken**: A review on the history of microcredit done by Dichter (2010) suggested that such credit was often used by the poor for consumption and rarely for business investment. Banerjee et.al. (2009) in their study mentioned that among the households who do not own a business and have no potential to start one use microcredit to increase their spending for food consumption or for purchasing nondurable goods but those who already has a business or have the potential to start with is likely to use credit to expand its existing business and as initial investment. So the vulnerable household wants to take loan for medical or house repairing or consumption purposes. But comparatively less vulnerable household generally prefers to take loan for income generating activity[6] or may not be interested to take loan. It is observed from field survey that most of the sample households belong to control group are not interested to take any loan from informal sources due to very high rate

[5] During the time of calculation of this ratio, the average monthly earnings of the sample households both belong to treatment group as well as control group from NREGS is treated as wage income. In our sample villages the rural households mainly belong to treatment group has y got on an average 30 man-days of employment annually under NREGS. Generally a rural household has to depend on NREGS for its livelihood if that household has little alternative earning opportunity. Number of man-days to get job under NREGS is very much dependent of the activities and blessings of local panchayet. It came out from our field survey that the rural households belong to treatment group on an average are getting job more in terms of number of man-days than the households belong to control group. This is because those rural households are well connected with the local panchayet. Some prevention of flood through constructing river dam under NREGS help the local small and marginal farmers to take the risk of double cropping which is able to generate little employment in the local agricultural labour market.

[6] Total number of survey done under SGSY is 126. Among these respondents, 95 respondents had taken loan from their respective group. Now all together 49 respondents had taken loan for agricultural purpose, 20 had taken loan for business purpose, 11 had taken loan for medical treatment, 1 had taken loan to develop the fishery system, 6 had taken loan for education purpose, 2 had taken loan to buy van, 1 had taken loan to develop animal husbandry, 1 had taken loan to establish book shop, 1 had taken for repayment of previous loan and 3 had taken loan for building houses. Here we can notice that respondents had taken loan mostly in agricultural purpose. 21 had taken loan for consumption purpose. Thus total number of respondents who had taken loan for income generating purpose is 74 and the rest 21 had borrowed for non income generating purpose. 2 respondents have taken loan for both income and non income generating activities between the concerned time periods. But three sample household belongs to control group have taken credit for income generating purposes from informal sources and two took credit for consumption purposes from non-institutional sources.

of interest and (or) other terms and conditions. So this component is not given much weight during the time of calculating the Vulnerability Index.

The method of calculation of vulnerability index is explained in Table-1.

Table-1: Method of Calculation of Vulnerability Index:

| Components | Variables and Score | Sub component Weight | Overall Weight |
|---|---|---|---|
| Asset:<br>Productive (Land or Shop) (current market value)<br><br><br><br>Durable assets (Cycle, T.V., Motor cycle, Farm Equipments ) calculation is done on the basis of current market value | 0 = 5<br><2000 = 4<br>2001-10000 = 3<br>10001- 50000 = 2<br>50001 = 1<br><br>0 = 5<br>< 2000 = 4<br>2001- 5000 =3<br>5001- 10000 =2<br>10001 = 1 | 0.70<br><br><br><br><br><br>0.30 | 0.30 |
| Size of Total Savings apart from SHG (Reference Period Last one year) | 0 = 5<br><300 = 4<br>301- 500 = 3<br>501 – 1000 = 2<br>1000 & above =1 | | 0.10 |
| Average Value of MPCE (at base year price) on the basis of Mixed Reference period | < Rs.250 = 5<br>Rs.251-400 = 4<br>Rs.401- 511 = 3<br>Rs.511- 600 =2<br>Rs.601 and above =1 | | 0.25 |
| Share of Wage to Total Average Monthly Income of the Household (reference period one year) | 0.91– 1 = 4<br>0.6 - .90 = 3<br>0.4 – 0.59 = 2<br>< 0.4 = 1 | | 0.25 |
| Causes of Loan taken (either from Microfinance institution of from Professional money | Food or Any other Consumption purposes = 5<br>Medical = 4<br>House Repairing = 3 | 0.40<br><br><br>0.30<br>0.20 | 0.10 |

| | | | |
|---|---|---|---|
| lenders) (reference period two years) | Income Generating Activity = 2<br>No borrowing = 1 | 0.10 | |

To identify the factors which can play a significant role to reduce vulnerability of the rural household we have to consider equation (2) whose dependent variable has already explained. Now the Explanatory Variables in equation (2) are as follows:

$D_1$ => This $D_1$ is treated here as dummy variable which takes the value '1' if the respondent has joined SHG under SGSY scheme in the $t_0^{th}$ period and will take the value '0' if the respondent belongs to control group.

$\Delta EMP_i$ => Change of empowerment index of the main woman of the $i^{th}$ household (either belongs to control group or belongs to treatment group) between the $t_0^{th}$ period and $t_2^{th}$ period. Poverty is not simply a lack of funds but vulnerability, powerlessness and dependency. Microfinance programme provides its members with social inputs, such as consciousness related health, child education sanitation etc. In the development process empowerment of women is considered as an economic and social up gradation of women and reduction of gender inequality. It is expected that women's well-being influences the well-being of the family members mainly the children. So enhancement of empowerment is treated as the enhancement of intra-household decision making power of the women and women can now control household's income, finance and assets more. Empowerment is basically an attribute. To covert that into variable form we have to calculate Women's Empowerment Index. The method of calculation of Empowerment Index is given in Appendix-1. We have to investigate whether given the values of other variables enhancement of empowerment after joining microfinance programme under SGSY scheme play any positive role to reduce vulnerability of the rural household between the concerned time periods.

$\Delta DRatio_i$ => Change of dependency ratio of the $i^{th}$ sample household both belongs to treatment group as well as control group. It is expected that after taking loan from the group the SHG member can become earning member of the family after utilizing the credit as working capital to start a small entrepreneurial activity like starting small shop or buy goat or cow etc. If this

happens then dependency ratio of the rural household will automatically fall which may help the rural household to reduce their vulnerability.

$\Delta CRIGA_i$ => Total size of credit taken by the respondent for investment in income generating activity. It is a variable related to microcredit programme. Higher size of credit mainly from the Self-Help Group under joint liability can be granted by other co-group members if and only if the microcredit borrower has credit worthiness. A less vulnerable household has better credit worthiness. It is also expected that higher size of credit taken for income generating activity help the borrower household to invest more on income generating activity which also can help them to start a business in bigger form or expand her existing business. This can also help the borrowing household to get high return i.e. more income and more consumption which may reduce its vulnerability.

$\Delta CRNIGA_i$ => Total size of credit taken by the member households for non income generating activities like for consumption, for education of their children, for house repairing or for out of pocket medical expenses either for her or for other family members. Credit taken for non-income generating activity will not give any direct return to the borrower. The member household has to take that mainly during the time of emergency and higher size of such loan may make people more vulnerable.

Before moving to the econometric result we have to look at Table-2 which describes summary statistics of the sample respondents both belong to treatment group as well as control group.

Table-2A: Summary statistics of the SGSY members:

| Variables | $t_0$ period | | | $t_2$ period | | |
|---|---|---|---|---|---|---|
| | Mean | Median | S.D. | Mean | Median | S.D. |
| VI | 2.426 | 2.41 | .67 | 2.23 | 2.34 | .70 |
| EMP | 6.36 | 5.98 | 3.69 | 10.16 | 10 | 3.66 |
| DRatio | 2.55 | 2.5 | 1.07 | 2.53 | 2.5 | 1.09 |
| CRIGA | 0 | 0 | 0 | 2420.8 | 2000 | 2373.79 |
| CRNIGA | 0 | 0 | 0 | 4480 | 0 | 1369.04 |

Source: Calculated by the author on the basis of data collected directly from field survey

Table- 2B : Summary statistics of the Non-members:

| Variables | $t_0$ period | | | $t_2$ period | | |
|---|---|---|---|---|---|---|
| | Mean | Median | S.D. | Mean | Median | S.D. |
| VI | 2.32 | 2.24 | .63 | 2.38 | 1.91 | .70 |
| EMP | 8.05 | 8 | 2.34 | 9.04 | 9 | 2.04 |
| DRatio | 2.28 | 2.5 | .64 | 2 | 2 | .63 |
| CRIGA | 0 | 0 | 0 | 0 | 0 | 0 |
| CRNIGA | 0 | 0 | 0 | 465 | 0 | 2541.00 |

Source: Calculated by the author on the basis of data collected directly from field survey

If we look on the above two tables it is clear that mean value of the vulnerability index of the rural household belongs to treatment group have decreased between the concerned time periods. But if we look at the households belong to control group it is observed that the mean value of the vulnerability index have slightly increased between the concerned time period. The table also indicates that member households are less vulnerable as compared to non-member households. The above table also shows that the value of empowerment index of the SHG members have improved much between the concerned time period if we compare that with the main woman belongs to non-member households. This seems to support the hypothesis that microfinance participation has an impact on reducing vulnerability. But we have to identify the factors related with microfinance participation which may reduce the vulnerability of the member rural household between the concerned time periods.

To identify the factors which may reduce the vulnerability of the rural household we have to estimate the parameters mentioned in equation (2) where $\Delta VI$ is treated as dependent variable. The result of the regression is presented in Table-3

Table-3: The Econometric Result: Dependent Variable is ΔVI

| The Variables | Estimated Values of the parameters and level of significance |
|---|---|
| Constant | .276* |
| $D_1$ | -.0935** |
| ΔEMP | -.0116* |
| ΔDRatio | .015 |
| ΔCRIGA | -.00075*** |
| ΔCRNIGA | -.00003 |
| $\overline{R^2}$ | .412 |

*, **, *** implies significant at 1%, 5% and 10% level.

So from the above table it is clear that after joining micro credit programme through forming Self-Help Group under SGSY scheme, the rural household belongs to treatment group is able to reduce their vulnerability within two and half year but here mainly the social factor i.e. enhancement of empowerment of the female SHG member plays a significant role to do that. More empowerment of women means the women now can participate more in decision making on utilization of credit, expenditure on well-being of themselves and of the children. This is the main concern in the poverty alleviation paradigm. Women's control over decision making is also seen as benefitting male dominated rural household through preventing linkage of household income to unproductive and harmful expenses. The women after joining microfinance programme is now more concerned about health, nutrition, importance of proper sanitation, drinking water particularly for the children which automatically reduces the micro level vulnerability of the rural households. It came out from our field survey that at $t_0$ period 54 out of 126 sample households belong to treatment group and 59 out of 111 sample households belong to control group did not use any proper sanitary facility but in the $t_2$ period only 6 sample households out of 126 belong to treatment group and 37 out of 111 sample households belong to control group did not use proper sanitary facility. The source of drinking water of the sample households both belong to treatment group as well as control group is mainly deep-tube well. So improvement and sustainability of these two factors reduces the incidence of illness of the members of the sample households mainly belong to treatment group which plays an important

role to reduce their vulnerability because in those sample villages the out of pocket medical expenses are very high due to non-availability of proper primary health centre.

Size of microcredit taken for income generating activity also plays a minor role for this reduction of vulnerability among the Self-Help Group members. So the vulnerability has decreased to those households who have taken credit for income generating activities. But change of dependency ratio and loan taken from the group for non-income generating activity does not play any significant role to reduce or increase vulnerability of the rural households belongs to treatment group.

**Conclusions**: This paper proves that microfinance programme under SGSY scheme is able to reduce vulnerability of the participating rural households. Financial services provided by microcredit programme helps poor households to make transformation from every-day survival to planning for future. Households are now able to send their children mainly the girl children to school for longer period and to spend more amounts for children's education. Increased earnings from this financial services help the rural households to get better nutrition and better living conditions which plays a significant role to lower the incidence of illness. Enhancement of empowerment of the SGSY members also plays a significant role behind this incidence. No SGSY member household was able to increase their land size between the concerned time periods but the market valuation of land has increased. Little work like construction of river dam in those survey areas under NREGS also help the marginal farmers to go for double cropping which also plays a significant role to reduce their vulnerability. Few member households has began to start their small business after taking credit from their respective group which also plays an important role to reduce the vulnerability as well as poverty of the member households. Implementation of NREGS also plays a supportive role to reduce vulnerability of the rural women.

References:

Banerjee. A.V. and et.al. (2009): 'The Miracle of Microfinance? Evidence from a Randomized Evaluation', Working Paper, Department of Economics, MIT

Besley Timothy, Stephen Coate and Glenn Loury (1993): 'The Economics of Rotating Savings and Credit Association' American Economic Review, 83: 792-810

Chaudhuri.S. Jalan. J. and A.Suryahandi (2002):' Assessing Household Vulnerability to Poverty from Cross Sectional Data: A Methodology and Estimates for Indonasia'; Discussion Paper, Columbia University

Cohen .M. (1999): 'Can Microfinance Reduce the Vulnerability of the Clients and their Household?' Paper presented in World Bank Summer Research Workshop on Poverty and Development.

Dichter .T. (2010): "Too Good to be True; The Remarkable Resilience of Microfinance' Harvard International Review; Spring, 18-21

Graham .A.N. Wright and et.al. (1999), "Vulnerability, Risks, Assets and Empowerment – The IMPACT OF Microfinance on Poverty Alleviation'; Contribution to World Development Report, 2001, Micro save – Africa and Uganda Women's Finance Trust'

Ligon.E. and L.Schechter (2003): 'Measuring Vulnerability'; Economic Journal: 95-102.

Swain Ranjula Bali and Maria Flora (2008): 'Effects on Microfinance on Vulnerability, Poverty & Risk in Low Income Households'; No-2008, Working Paper Series, Department of Economics, American State University, Washington.

Appendix: **Calculation of Women's Empowerment Index**: (Asked either the member or wife of the member or the non-member respondent)[7].

| Name of the Variable | Points |
|---|---|
| 1. Decision about utilization of Micro-credit | Female:-2, Both:-1, Male:-0 |
| 2. Decision on purchase of daily food items | Female:-2, Both:-1, Male:-0 |
| 3. Decision on purchase of live stock | Female:-2, Both:-1, Male:-0 |
| 4. Decision on purchase of utensils and other household items | Female:-2, Both:-1, Male:-0 |
| 5. Decision on child education, child vaccination and other health related matters | Female:-2, Both:-1, Male:-0 |
| 6. Does she earn regularly and contribute in her family? | Yes:- 2, No:-0 |
| 7. Can she participate in different gram sabhas according to her will? | Yes: -1, No:-0 |
| 8. Can she spend for consumable goods (cosmetics) according to her will? | Yes: -1, No:-0 |
| 9. Can she go outside without taking permission from her husband or elder son? | Yes: -1, No:-0 |
| 10. Can she cast her vote according to her will? | Yes: -2, No:-0 |
| 11. Can she protect herself against domestic violence? | Yes: -1, No:-0 |
| 12. Decision on Family Planning | Female:-2, Both:-1, Male:-0 |

Maximum point is 20 and more point indicates more Empowerment of Woman or more intra-household decision making power of the main woman of the sample household.

[7] All the respondents of SGSY are woman and the respondents belong to control group was either woman or married man.