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Kundu, Amit and Mitra, Suranjana

Department of Economics, Jadavpur University

7 March 2009

Online at <https://mpra.ub.uni-muenchen.de/22131/>  
MPRA Paper No. 22131, posted 16 Apr 2010 23:56 UTC

# **Determinants Influencing a Rural Household's Preference to Join Individual Liability or Joint Liability Micro Credit Contract Operated by Primary Agricultural Credit Society**

**AMIT KUNDU,**

**Reader, Department of Economics, Jadavpur University, Kolkata, West Bengal, India.  
Pin-700032, E-mail: akundu1970@rediffmail.com, or akundu29@rediffmail.com**

**&**

**SURANJANA MITRA**

**Senior Lecturer, Department of Economics, Loreto College, Kolkata, West Bengal, India,  
Pin-700071 E-mail : mitra\_suranjana@yahoo.co.in**

## **Abstract**

Agriculture credit which is one form of micro credit mainly for the small and marginal farmers can be borrowed under two different types of short-term credit contracts: individual liability credit contract or joint liability credit contract under Primary Agricultural Credit Society (PACS). The basic objective of this paper is to identify the factors which influence a rural household to link himself directly with PACS for credit contract under individual liability micro credit contract or to take the initiative to join self-help group under PACS so that if required he/she can take credit under joint liability credit contract. Results reveal that higher education level and age reduces the probability of a rural people to join self-help group but aged farmers with certain size of land prefers to take credit under individual liability loan contract after taking direct membership of PACS. But ownership of land and its size is not a decision making factor during the time of formation self-help groups under PACS. Actually poor people with zero or small size of assets i.e. mainly the risky type borrowers were not ignored during the time of group formation.

**Keywords:** Agricultural credit, micro credit, individual liability, joint liability, Primary Agricultural Credit Society.

**JEL Classifications:** G21, G14.

**Corresponding author:** Dr. Amit Kundu, Reader, Department of Economics, Jadavpur University, Kolkata, West Bengal, India, Pin-700032. E-mail: akundu1970@rediffmail.com, akundu29@ediffmail.com, Phone: (0) 9830505312.

We are deeply indebted to anonymous referee whose valuable comments helped us to enrich our earlier draft.

# **Determinants Influencing a Rural Household's Preference to Join Individual Liability or Joint Liability Micro Credit Contract Operated by Primary Agricultural Credit Society**

## **Introduction:**

Formal sector lending to the rural poor, is plagued by severe problems of inadequate coverage, very low rates of repayment and imprecise targeting. Most of these problems can be traced to two underlying factors, lack of information and inadequate collateral (Roy Chowdhury, 2005). Micro credit has become the cornerstone of many development strategies. It appears to offer a “win-win” solution where both financial institutions and poor clients can generate profit (Murdoch, 1999). The idea of micro credit has now spread globally, with replications in Africa, Latin America, Asia and Eastern Europe, as well as in richer economies like Norway, the United States, France and England (Fedele, 2005). Micro credit as a major tool against world poverty is polarized over the debate of the virtues of individual versus joint liability loan contract where in joint liability micro credit program we generally follow the model of Bangladesh Grameen Bank and in individual liability loan contract we follow the model of Bank Rakyat in Indonesia. But the group loan methodology has already been widely imitated and adopted. The World Bank and other international organizations channel most of their large financial support for micro credit into group lending programs (Madejewicz, 2004). The premise of joint liability lending is that if one borrower cannot repay a loan, then other members of joint liability group will have to repay that. Joint liability lending is a potential breakthrough strategy in economic development (Ahlin and Townsend, 2003). Under group liability, clients have an incentive to screen other clients so that only trustworthy individuals are allowed into the program. Thus group liability claims to overcome information asymmetries typically found in credit markets, especially for households without collateral. Actually, it mitigates the problem created by adverse selection and leads to positive assortative matching. The problem of moral hazard can also be mitigated through group lending because the borrower will be less willing to take huge amount of loan and will invest in less risky project if the contracts are enforceable and peer monitoring is present.

Critics, however, argue for simpler individual loans monitored by locally recruited loan officers. They claim that these loans achieve results that are as good as or better than group loans. (Conning, 2000). In recent years, Association for Social Advancement (ASA) in Bangladesh or

the Bank Rakyat Indonesia (BRI), have expanded rapidly using individual liability loans. Others, like BancoSol in Bolivia, have converted a large share of its group liability portfolio into individual liability lending. The Grameen Bank in Bangladesh also has recently relaxed group liability clause (Gine and Karlan, 2007). Even though group lending has its own advantages, individual liability loan contract which is another form of micro credit cannot be ignored. Thus the factors that motivate a rural individual to decide which system of loan contract he/she prefers to adopt in future can be an important aspect of research in micro finance.

### **Overview of Literature:**

Empirical research on group versus individual liability lending has not provided policymakers and institutions the clear evidence required determining the relative merits of the two microfinance systems. Instead the focus has been on which group characteristics lead to higher repayment or which program design do individuals choose. Huppi and Feder (1990) observed that the most successful group lending programs have been those where loans were made to self-selected groups of homogeneous individuals belonging to the same village and with similar economic standing. Conning (2000) has shown that an advantage to joint liability loans exist even under the more realistic assumption that borrowers cannot side-contract and monitoring is costly and subject to moral hazard. Ghatak (2000) in his theoretical study explained how joint liability can achieve high repayment rates even when borrowers have no conventional collateral to offer. Ahlin and Townsend (2002) raised a question – which type of loan contract has a higher repayment. They observed that social structures that enable penalties can be helpful for repayment while those which discourage them can lower repayment. Ahlin and Townsend (2003) in their study found that a wealth level further away from the village average makes choice of a group loan over an individual loan more likely. Madajewicz (2004) established that lenders who use individual liability loans look no different than do group lenders when judged by repayment rates and they tend to be more profitable. She also stated that the poorest borrowers served by group lending programs are often poorer than the poorest clients of individual lenders. Armendariz and Murdoch (2005) argued that group lending contract provides a way to achieve efficient outcomes even when the lender remains ignorant or unable to effectively enforce contracts. Group lending does better than traditional individual lending and makes lending sustainable by inducing peer monitoring and overcoming enforcement problems. Roy Chowdhury (2005) in his study showed that in the presence of joint liability, the rate of

monitoring is higher thus leading to a greater rate of repayment. Simtowe and Zeller (2006) have shown in their study that micro finance institutions offering both joint and individual liability loan contracts must relax their rule on joint liability by allowing borrowers with dynamic and growing investments who make use of group loans at the beginning to switch individual credit offers when they are in need of higher loans to reduce mismatching problems and enhance dynamic incentive. Gine and Karlan (2007) observed that individual liability compared to group liability leads to no change in repayment but did lead to more individual borrowing. They also found statistically significant evidence of screening and monitoring but did not find that it adds to economically meaningful way to higher default. Lightfoot from Bank for Agriculture and Agriculture Cooperatives (BAAC) stated that farmers involved in joint liability borrowing are relatively small scale farmers who borrow relatively small amounts. Sarangi (2007) in his study indicates the exclusion of very poor households from participation in group-based credit programs. Madajewicz (2004) established in her theoretical model that group liability loan is only desirable for the poor borrowers. In her model, below a certain level of wealth, group liability dominates individual liability. But above a certain wealth individual liability will be preferred by rural households. Gine and Karlan (2007) found less willingness among bank officers to open groups despite no increase in default. According to Lehner(2008), micro finance institutions offer group loans when size of credit is quite large. With a rather small loan size, all micro finance institutions offer individual loans Kundu (2009) in his primary data based study observed that wealthier among the less affluent rural households prefer to join microfinance system operating on the basis of individual liability loan contract through a micro finance institution and comparatively less wealthy households prefer to join micro finance system operating on the basis of joint liability loan contract. But households with no asset or little valued asset are less possible to join in any micro finance system..

**Micro credit programme through Primary Agricultural Credit Society (PACS):**

The cooperative movement which is the largest socio economic movement in the world, has contributed significantly to the alleviation of poverty, creation of productive employment as well as the enhancement of social integration in the country. The cooperative sector is mainly concerned with agricultural credit, marketing of agricultural produce and distribution of fertilizers and pesticides and other essential commodities. Cooperative Credit Societies Act of 1904 and 1912 was the first important landmark in the agricultural credit policy in India. The All

India Rural Credit Review Committee (1969) and the Agricultural Credit Review Committee (1989) opined that from the point of view of structural appropriateness, there is no alternative to cooperatives at the village level for provision of agricultural credit. The cooperative banking system has a three-tier structure providing short-term, medium-term and long-term agricultural credit with Primary Agricultural Credit Societies at the village level, the Central Cooperative Banks at the district level and the State Cooperative Banks at the state level. The formation, registration, operation and winding up of cooperatives are governed by state laws and regulations. Since agriculture is and will presumably continue to be the main economic activity of many rural people, therefore agriculture credit is and will be the primary need. But the problems of agriculture credit like lack of required loan collateral, risks associated with agriculture lending due to yield uncertainties, price fluctuations, low loan repayments, changes in domestic and international policies and high financial transaction cost failed to produce the desired results. Microfinance emerged as an alternative credit delivery mechanism to formal banking in rural India. There is no specific estimate of the size of microcredit. But informally we can say if the size of credit is not more than Rs.20000 then that credit can be treated as microcredit. Agriculture credit for the small and marginal farmers can be treated as one form of micro credit because the size of credit disbursed through PACS is a function of the size of land owned by the borrower. It can be borrowed under two different types of short-term credit contracts: individual liability credit contract and joint liability credit contract under Primary Agricultural Credit Society. Short-term credit is also known as the crop loan which helps the farmer to increase and maintain his productive ability. Primary Agricultural Credit Societies draw their finances from Central Cooperative Banks who in turn draw their finances from State Cooperative Banks and the State Cooperative Banks draw their finances from National Bank for Agriculture and Rural Development. PACS also contribute in the formation and nurturing of SHGs in many districts of West Bengal including Hooghly. NGOs do not play any significant role in the formation of SHGs in Hooghly. Nor is there any specific MFI to cater to the needs of SHG. Thus simultaneous existence of individual liability credit contract and joint liability credit contract through PACS is a significant feature in Hooghly district of West Bengal.

### **Individual Liability Micro credit Contract through PACS:**

Credit given directly to individuals also form a part of the microfinance technology. Many institutions have adopted the individual credit route for microfinance. In India, Cooperative banks, via the Primary Agricultural Credit Societies play a very important role in priority sector lending. In order to avail of the loan facilities of Primary Agricultural Credit Society (PACS) an individual will have to fulfill certain conditions, which is same for all PACS of Hooghly district. The information on mode of operation of Individual Liability micro credit contracts through PACS was collected from three Managers of three PACS and that was crossed checks by the Chief Executive Officer of DCCB ,Hooghly. The basic eligibility criterion for agricultural loan from PACS is that the individual will have to be a member of PACS. Therefore a person who is not a member of PACS will first have to apply for membership stating the reason for wanting to be a member and pay a nominal entry fee or admission fee. The amount of entry fee varies from one PACS to the other. The applications are usually submitted during the crop seasons i.e. Kharif (April to August) or Rabi (October to January) season as membership is mandatory for agricultural loan from PACS which has to be passed by the Board of Directors in the meeting. During each season, the Board of Directors meets at least thrice to discuss the membership issue. There is an agreement between the loanee and the society stating the amount of loan, the interest rate to be paid and the repayment period which has to be accepted by the loanee. This is known as “*tomsuk*”. When the application is passed by the Board of Directors of the respective PACS, the applicant is to pay the membership fee which varies from one PACS to the other and is decided in the Annual General Meeting of PACS. The membership fee, different from entry fee is paid through purchase of share issued by the respective PACS. The value of each share is decided in the Annual General Meeting of PACS. But a minimum of one share is to be bought for membership. No dividend is declared by PACS on shares. The loanee then submits the photocopy of ‘land deed’ or ‘porcha’ and the original copies of the same are to be produced to validate the ownership right. In case of a ‘bargadar’ or ‘patta holder’ the land record is considered as the document. The “bargadar” or “patta holder” receives 50% of the scale of finance as loan. Since land is the only asset owned by a farmer it acts as the collateral security for PACS. If the amount of loan is greater than Rs.5000 then the land is registered in the name of the respective PACS known as ‘mortgage carbonnama’. After this entire procedure is over and

the person is considered eligible for loan facilities, the person opens a savings deposit A/C with the respective PACS if the person does not hold one and deposits a minimum of Rs. 50 in the account. This system of opening an account with the PACS has been effective only since the introduction of 'Kisan Credit Card' (KCC) scheme in 2002 in Hooghly. At this point the KCC is issued in the name of the loanee. The loanee then fills in a 'voucher' with the details of his/her name, address, the KCC number and amount of the loan applied for. The voucher is signed by the loanee and two witnesses. The loan amount sanctioned is then transferred to the account as per the 'scale of finance'. The loanee becomes eligible to withdraw the entire amount of loan sanctioned or in installment according to the needs at different stages of cultivation.

The amount of loan sanctioned depends on the credit limit known as '3 Year Composite Credit Limit' scheme which is calculated with the help of the following simple formula –

Credit Limit = Scale of Finance \* Amount of Land for Cultivation.

Scale of finance is different for different crops. It is determined by using the different cost of components of cultivation. It is calculated in the following way.

Scale of Finance =  $f(C_S + C_M + C_F + C_{PPC} + C_L + C_I)$

where  $C_S$  = Cost of seeds,  $C_M$  = Cost of manures,  $C_F$  = Cost of fertilizers,  $C_{PPC}$  = Cost of plant protection chemicals,  $C_L$  = Cost of labour,  $C_I$  = Cost of Irrigation.

Even though scale of finance depends on cost of different components required for cultivation, the entire amount is not provided as loan. But for some crops like potato and vegetables the amount of loan sanctioned is greater than the cost of cultivation per acre of land. No justification could be provided for such a behavior by the Technical Committee. The table for scale of finance for paddy, potato, jute, vegetables and mango is provided in Table 1. Credit limit which is dependent on scale of finance is fixed by District Level Technical Committee under the Chairmanship of Principal Agricultural Officer (PAO) on the basis of one acre of land<sup>1</sup>. It is fixed for three years. But if the cost of components increases during these three years then there is a provision of introducing supplementary credit limit even before the completion of three years. As the cost of cultivation of different crops is different the amount of credit sanctioned for one acre of land is also fixed but different.



Rural West Bengal is now dominated by small and marginal farmers whose size of land is less than 3 acres. So their requirement for agricultural credit is also small. Primary Agricultural Credit Society can fulfill their requirement of small credit which can be termed as micro-credit. PACS charge interest on agricultural loan which is fixed by the Government of India through NABARD. The rate of interest charged by PACS for agricultural loan from borrowers was 12.5%, in 2003 and that has dropped to 7% in recent years. This loan is now refinanced by the branch of the District Central Cooperative Bank Ltd. at the rate of 5% per annum. The loan is to be repaid within a year from the date of disbursement. If the cultivator is unable to repay the loan within the stipulated time period then an overdue of 2% is charged along with the existing rate of interest. Even though the repayment period is one financial year yet the rate of interest charged during this period is not the same for all crops.<sup>2</sup>

Since the introduction of 'Kisan Credit Card' scheme the cultivator does not have to wait for the loan. The scheme aims at providing adequate and timely credit for the comprehensive credit requirements of farmers for taking up agriculture and allied activities. Even though agricultural credit is provided by commercial banks as well and at the same rate of interest as that of PACS yet it has been experienced that people prefer to borrow from PACS because of the known environment. In addition to land, gold is also accepted as collateral by commercial banks. The employees of the respective PACS belong to the same village and thus the borrowers are at ease and more comfortable in borrowing from PACS. Ignorance and illiteracy also prevent the borrowers from approaching the commercial banks for agricultural credit where they find the process to be cumbersome and complicated. Sometimes, distance of the commercial bank from the village also hinders the borrower's eagerness to borrow from the commercial bank. Thus the importance and operation of PACS in the rural areas in case of individual liability micro credit contract is enormous.

### **Group Lending Program under PACS through formation of Self-Help-Group.**

The group approach on the contrary delegates the entire financial process to the group rather than the financial institutions, here PACS. These groups are in turn linked to a microfinance institution for sourcing of additional funds as well as depositing their savings. "Group liability" refers to the terms of the actual contract whereby individuals are both borrowers and

simultaneously guarantors of other clients' loans (Gine and Karlan, 2007). A self-help group (SHG) is a small, economically homogenous and affinity group of the rural poor, voluntarily coming together to save small amount of money regularly, provide collateral free loans with terms decided by the groups and have collective decision-making. Under the cooperative-SHG linkage programme, groups can be formed directly by the different branches of Cooperative Banks or via PACS. Harper, Berkhof and Ramakrishna (2005) in their study found out that the more successful a DCCB is at SHG linkage, the higher the proportion of SHGs linked to the PACS. The process of forming groups by PACS and the different branches of DCCBs are same and that is narrated below.

- A locality is chosen and the target group is selected. The women of the chosen locality particularly belonging to poor families are the target group.
- The target group is addressed by the staff from PACS or by employees of branches of DCCBs who are entrusted with the task of initiating the movement along with officers from NABARD and DCCB. Sensitization camps and motivation programs are organized for the target group.
- The target group self-select their members (at least five and not exceeding fifteen) having same economic status to form a self-help group.
- The members first decide a name for the group which will be a unanimous decision by all the members of the group in the first meeting.
- After the group name is decided, a leader and a deputy leader are selected from among the members. Usually a literate member is selected as the leader. If all members in a group are illiterate, the SHG supervisor helps them to maintain accounts and keep record of meetings.
- The amount to be deposited as savings on monthly basis is decided by the members of the group which varies from Rs. 10 to Rs. 50. The money must be given by the 10<sup>th</sup> of every month to the leader of the group

- After the first month's collection the leader opens an account with the PACS or with the branch in the name of the group and deposits the amount collected from the members of the group. A passbook is issued in the name of the group. The money is deposited by the 10<sup>th</sup> of every month in the account with the society. The group deposit earns interest which is currently 4% per annum.
- The group has to maintain the following documents- a Minutes Book, a Cash Book, a deposit ledger and a loan ledger.
- The group has to save for six months. The group is constantly monitored by the SHG supervisor, an employee of PACS during these six months.
- Several training programs are arranged by PACS for the target group to create self employment opportunities for the target group. The different types of training programs are mushroom cultivation, production of vermi compost, tailoring, poultry etc. Non-government organizations do not play any role in the nurturing of SHGs in these two blocks.
- After six months the group becomes eligible for loan facilities. The group is sanctioned four times the amount deposited as loan. The loan is granted in the name of the group after which the loan is distributed among the members either depending on the need or equally which again depends on the unanimous decision of the group members. The loan is repaid to the group within a stipulated time period and along with an interest rate decided by the members of the group, usually 12% per annum. There are different reasons for which a group member may take a loan. Loans can be both for consumption as well as production purposes. Productive loans can be for self employment or for agriculture purposes.
- The loan is repaid by the members to the group which in turn is repaid to the PACS or the branch. The branch or the PACS charge some interest rate which again differs from one PACS to the other. The repayment period for the group is decided by the group unanimously. The repayment period for the branch or PACS is decided by the respective agencies. There is a maximum time limit within which the loan must be repaid to the

agencies. It is observed that the group members are very eager to repay the loan in order to avail of the successive loan facilities.

The basic objective of our paper is to identify the factors which influence a rural household to link himself directly with PACS for credit contract under individual liability micro credit contract or to take the initiative to join Self-Help Group under PACS so that if required he (she) can take credit under joint liability credit contract.

### **Sample Design and Sample Size:**

The sample is drawn from Hooghly district of West Bengal. Hooghly has been selected because it has the maximum number of self-help groups provided with bank loan which are formed by PACS and the amount of loan disbursed to these groups by the District Central Cooperative Bank is also the largest (Progress of SHG –Bank Linkage in India 2005-06, NABARD). The role of the Hooghly District Central Cooperative Bank Ltd. (HDCCB) in microfinance is also significant compared to the Cooperative Banks of other districts and has been considered as the role model for many districts and states. There were 8419 savings-linked SHGs out of which 8395 were under PACS of HDCCB as on 31.03.03. The total number of female SHGs was 8242. The total number of credit-linked SHGs was 5296 out of which 5087 were female SHGs. The amount of savings deposit mobilized by SHGs was Rs. 214.43 lakhs and the amount of loan disbursed was Rs. 666.67 lakhs. The repayment rate was 98%. (Annual Report of Hooghly District Central Cooperative Bank Ltd.). Out of the eighteen blocks in Hooghly, only two blocks have been selected for the survey randomly and these two sample blocks are (i) Chinsurah-Mogra and (ii) Tarakeshwar. Chinsurah-Mogra and Tarakeshwar are chosen because both are tribal based communities with a considerable percentage of people lying below the poverty line. Chinsurah-Mogra has two PACS affiliated to Hooghly DCCB Ltd - Digsui Union Large Sized Primary Cooperative Agricultural Credit Society Ltd. and Talandu Sech 'O' Samabyay Unnayan Samiti Ltd. The former is the oldest. This is also another reason for choosing Chinsurah-Mogra. This society was formed on 5<sup>th</sup> March 1957 at Digsui catering to the needs of 13 villages – Digsui, Khalsi, Gannegarh, Bagri, Daharchakulai, Mamudpur, Kabirhati, Naksha, Fatehpur, Taragun, Champarui, Aashphal and Rajarambati. Since 1996, SHG loan is also being provided by the society. The latter was formed on 26.12.73. It covers two villages – Talandu and

Bharatpur. SHG loan has been introduced in this society since 1998. In Tarakeshwar there are eighteen PACS out of which one is chosen randomly and it is known as Vivekananda Samabyay Krishi Unnayan Samiti Ltd. Incidentally it has the maximum number of savings-linked and credit-linked groups. This society was formed on 17<sup>th</sup> September 1977. It covers five villages – Kanaria, Mohonbati, Nacchhipur, Tullyan and Champadanga. SHG loans are also provided by this society since 1999. All the three PACS provide agricultural credit through both individual and joint liability loan contract system. Other than crop loan the societies also disburse SHG loan. The loan disbursed through SHGs was utilized both for agricultural purpose as well as for other purposes like consumption, construction and repair, business etc. But the information on the amount of loan used for agricultural purpose out of the total SHG loan is not available. As for Digsui Union Large Sized Primary Cooperative Agricultural Credit Society Ltd. other loan included education and medical loan. Similarly, Talandu Sech 'O' Samabyay Unnayan Samiti Ltd. also disburses term loan and SHG loan. The different types of loan disbursed by Vivekananda Samabyay Krishi Unnayan Samiti Ltd. were salaried loan, pledge loan and SHG loan along with crop loan. The rate of recovery varied between 80% and 90% for all the three PACS. The areas surveyed have double cropping pattern of agriculture with Aman and Potato being the largest choice. Since all lands in the sample have double cropping, the annual net return from one acre of land is almost identical.

The sample consists of two treatment groups and one control group or reference group. The number of individuals who joined individual liability loan contract in 2004 which is the base period (i.e. t<sup>th</sup> period) was first selected and then a sample was drawn from each of the three PACS. Considering all the three PACS, out of 160 members 115 were selected on the basis of availability and easy communication. The survey period was from August to November in 2005-06<sup>3</sup>. This period was chosen to minimize the recall period of each respondent. For joint liability loan contract system, all the groups that were formed in 2004 were not considered as sample though not too many groups were formed during this year. The total number of groups formed during this year in the three PACS was 57 and out of 57 SHGs, 47 were selected as sample SHGs. We considered all the members of the sample groups as respondents and total sample size under joint liability loan contract became 276. So in our sample, the rural households of the same villages had the option of joining any of the loan contract systems or not become a member of

any system. After the sample households were selected the socio economic conditions were studied in order to determine the factors that can influence an individual to join either individual liability or joint liability loan contract through formation of Self-Help Group with the help of a well framed detailed questionnaire. Thus the sample has three categories:

1. Individuals who have taken direct membership of PACS in the  $t^{\text{th}}$  period so that they can take credit directly from PACS under individual liability loan contract system. These individuals belong to Treatment Group-1
2. Individuals who have taken membership of self-help group in the  $t^{\text{th}}$  period and plans to take credit in future when required from her respective group under joint liability loan contract. These individuals in our paper belong to Treatment Group-2.
3. Individuals, from almost identical socio-economic background who are not members of either loan contract systems in the  $t^{\text{th}}$  period but have the eligibility to join any of the systems. These sample respondents belong to control group.

We have already mentioned that the total sample size is 491 out of which the first treatment group has 115 individuals while the second treatment group includes 276 individuals. The control group has 100 individuals who are chosen from the same sample villages from almost same socio-economic background. During the time of drawing of the sample, care has been taken to see that no individual belong to both the loan contract systems in 2004.

**Identifying the Factors which influence the rural households to take either direct membership of Primary Agricultural Credit Society or indirectly through formation of Self-Help Group:**

To identify the factors which can influence or increase the probability of a rural household to take direct membership of PACS to borrow in future from that formal credit institution either on individual basis or to form self-help group to borrow from that respective group under PACS on the basis of joint liability credit contract, we have to consider the following Multinomial Logit Regression Model.

$$Y_{jt} = \beta_0 + \beta_1 \text{LAND}_{jt} + \beta_2 \text{DRATIO}_{jt} + \beta_3 \text{ICOMOH}_{jt} + \beta_4 \text{EDU}_{jt} + \beta_5 \text{AGE}_{jt} + \beta_6 \text{OSBROW}_{jt} + u_j$$

where  $u_j$  is the disturbance term.

Here the dependent variable  $Y_j$  can be expressed as

$Y_{jt}=1$  if the respondent has joined individual liability loan contract in the  $t^{\text{th}}$  period.

$Y_{jt} = 2$  if the respondent had joined joint liability loan contract through formation of self-help group in the  $t^{\text{th}}$  period.

$Y_{jt} = 3$  if the respondent did not join any of the loan contract in the  $t^{\text{th}}$  period.

The explanatory variables of the above model can be expressed in the following way:

Since land is the main asset possessed by these individuals in a rural economy and it acts as the collateral for PACS, the primary determinant of the above decision making factors is the size of land which is expressed here in terms of acres.

The other explanatory variables are- Adult Equivalent Dependency Ratio of the sample household in the  $t^{\text{th}}$  period ( $DRATIO_{jt}$ ), Income from other sources in the  $t^{\text{th}}$  period ( $INCOMOH_{jt}$ ), Education level of the sample respondent in the  $t^{\text{th}}$  period ( $EDU_{jt}$ ), Age of the respondent in the  $t^{\text{th}}$  period ( $AGE_{jt}$ ), and Borrowing from other sources by the respondent in the  $t^{\text{th}}$  period ( $OSBROW_{jt}$ ).

Dependency ratio of a household is the ratio between total number of adult equivalent family members, and total adult equivalent earning member of that respondent household. Following Townsend to get adult equivalent family member we have considered 1 for any adult family member (both male and female), .25 for any member of that household up to six years of old and .50 for any member of the household between 6 to 14 years of old. Dependency ratio reflects the savings and loan repayment capability of the rural households. From the field survey it came out that household with higher dependency ratio spends their major earnings for consumption purposes and very less amount is left for savings and if required for loan repayment. So this type of household can be treated as '*risky*' borrower and they may either prefer not to join in any type of microcredit program or under joint liability credit contract where the size of compulsory contribution is small and burden of loan repayment can be shared.

Here income of the sample respondents from other sources include wage income as agricultural labourer, earnings from selling milk products, working in potato stores, small business like grocery shop, cycle repairing shop and tea stalls, tailoring, wage income as labourers after being engaged in different activities as masons, carpenters, trolley drivers, providing tuitions and earnings from working in small firms. Income of a household represents its solvency. So a household with higher income may prefer to join microfinance system under individual liability loan contract or a household with comparatively less income may prefer to join group or household with very low income may prefer not to join in any type of microfinance program.

Borrowing from other sources is treated as dummy variable.  $OSBROW_{jt} = 1$  if the respondent already has few borrowings from other sources other than PACS in the  $t^{th}$  period mainly from professional money lenders or relatives or neighbours and  $= 0$  if that did not happen.

Education as an explanatory variable is defined in our model in the following way.

Illiterate	0
Class I-IV	1
Class V-VIII	2
Class IX -X	3
Class XI-XII	4
Graduate	5
More Than Graduate	6

Education level of a prospective member represents his/her analysis power. Education can help the prospective member to become much aware about pros and cons of two different types of microfinance system and can take decision before joining any microfinance program. It came out from field survey that uneducated rural people in the sample villages are not so much willing to join any program because they fear that their deposited money can not be recovered.

Age of a rural people reflects his/her productive capacity because they mainly earn through physical labour. It is observed that rural people more than 55 years of age are sometimes reluctant to join any type of microfinance program. Sometimes they are reluctant to join any group because they think at this age they will not be able to ‘adjust’ themselves with other group members. Again under joint liability microcredit contract through formation of self-help group, sometimes a group member has to wait to get credit longer time period even after repaying her first loan. This is a problem for an aged member. But individual liability loan contract is free from this problem. They can interact directly with PACS and can demand credit any time when required.

Before going to the Multinomial Logit Regression result, initially we have to look at the summary statistics of the different explanatory variables which is shown in Table-1. Here we consider only the mean values and standard deviations are presented in the parenthesis.



**TABLE-1:** Summary Statistics of the Explanatory Variables:

Variables	Y <sub>j</sub> = 1	Y <sub>j</sub> = 2	Y <sub>j</sub> =3
LAND <sub>jt</sub> (acres)	1.56 (1.54)*	0.4 (0.75)	0.6 (.67)
DRATIO <sub>jt</sub>	2.57 (0.79)	2.31 (0.94)	2.41 (0.97)
ICOMOH <sub>jt</sub> (Rs.)	2672.4 (2845.5)	2118.95 (1805.48)*	2647 (1565.7)
EDU <sub>jt</sub>	2.39 (1.36)*	1.15 (0.99)*	2.08 (1.3)
AGE <sub>jt</sub>	43.46 (8.76)*	31.43 (9.96)*	36.51 (9.4)
OSBROW <sub>jt</sub>	0 (0)*	.08 (.27)	.18 (.39)
Sample size	115	276	100

\* Significant at 1% level.

From the above table we can draw the following inferences:

1. There is no significant difference in average size of land between treatment group2 and control group. But average size of owned land of treatment group1 is significantly more than the average size of owned land owned by the rural households belongs to control group.
2. There is no significant difference in average size of adult equivalent dependency ratio between the households of any treatment group and control group.
3. Average income of the sample respondents from other sources belonging to control group is significantly more than the average income from other sources of the sample respondents who had just formed Self-Help Group. Statistically it is also established that there is no significant difference in mean value of average income of the sample respondents from other sources belonging to Treatment group1 and of control group.
4. There is significant difference of average level of education of the sample households belonging to any treatment group and that of control group.
5. Average age of the sample households belong to Treatment group1 is significantly more than that of control group. Similarly average age of the sample households belonging to Treatment group2 is less than that of the sample respondents belonging to control group. So young women prefer to form Self-Help Group under PACS in the sample villages

6. There is no significant difference in average borrowing from other sources between Treatment group 2 and control group. But significant difference is observed between Treatment group 1 and control group.

The results from Multinomial Logit Regression model mentioned above is shown in Table-2.

**TABLE 2**

REGRESSOR	$Y_j=1$	ODDS RATIO	$Y_j=2$	ODDS RATIO
Intercept	-3.799*		3.576*	
LAND <sub>jt</sub>	.415*	1.515	-1.131	.877
DRATIO <sub>jt</sub>	.209	1.232	.181	1.199
ICOMOH <sub>jt</sub>	-1.988E-04**	1.000	7.883E-05	1.000
EDU <sub>jt</sub>	.234	1.263	-.682*	.505
AGE <sub>jt</sub>	6.745E-02*	1.070	-5.609E-02*	.945
OSBROW <sub>jt</sub>	-24.787	1.718E-11	.129	1.138

Pseudo R<sup>2</sup>: Cox and Snell= .464 and McFadden= .315

\* Significant at 1% level

\*\* Significant at 5% level

The above results can be interpreted in the following manner:

1. Higher the size of land, higher will be the possibility of a rural household to become a direct member of PACS so that they can take credit from that formal financial institution on the basis of individual liability loan contract. The value of Odds ratio which is more than one supports our inference. Actually, greater the size of land, more can be produced; hence capacity to repay the loan is also very high. Since amount of loan depends on the size of land and cost of cultivation, greater the land size more will be the credit limit. With more size of land, economic standing of households improves and individuals can borrow independently without any peer pressure and group dynamics. On the other hand, size of land does not play any significant role during the time of taking decision of forming Self-Help Group for joint liability loan contract because participants of this system are not so affluent and do not possess large size of land and for those who possess land the size is so small that they cannot afford to borrow larger size of credit.
2. Adult equivalent Dependency ratio does not play any significant role during the time of taking decision to join PACS directly or indirectly through formation of self-help group.
3. With more income from other sources probability of a farmer to join PACS for agricultural credit under individual liability loan contract falls. More income from other

sources can provide enough savings and hence lesser need to borrow. But this does not play any significant role in influencing anyone in joining a self-help group.

4. If individuals are more educated, then probability of joining self-help group decreases (as the value of the odds ratio is less than one). Actually from field survey it came out that homogeneity of the group is lost if someone more educated joins the group. It is feared that there shall be a tendency of the comparatively more educated members to overpower others who are less educated. Therefore, the other members are not interested in including such a member. On the other hand, level of education of the main member of the rural household does not play a significant role at the time of taking decision on joining PACS for taking individual liability loan contract in future.
5. Aged people have a tendency to join individual liability loan contract (value of odds ratio is more than one in case of the prospective members of PACS). They prefer individual liability because they do not want to wait for a loan which depends on the group's decision in case of joint liability. But for aged people probability of joining a group falls and there is a tendency to become a non-member. Old-aged women are not motivated to undertake any income – generating activity because of their age and they are less interested in empowerment or social freedom and they prefer to fall back upon traditions and customs.

The correlation between economic status and membership is potentially in accordance with theory of joint liability when following Ghatak (1999) safe and comparatively wealthy borrowers always form group with safe borrowers. The poor members are excluded from the group. But here it is observed that higher size of land and income from other sources does not improve the probability of a rural household to join self-help group mainly formed by PACS. So we can say, contrary Ghatak that poor members are considered during the time of group formation and there is no significant importance of income and any form of asset during the time of choosing co-group members.

6. Borrowing of the sample respondents from other sources in the t<sup>th</sup> period does not influence an individual in their decision-making regarding joining either of the any type of loan contracts.

## **Conclusions:**

So we can say rural households with larger size of land are more prone to take direct membership of PACS so that when required they can easily take micro credit from primary agricultural credit society under individual liability credit contract. But ownership of land of a rural household and its size is not considered during the time of forming self-help group under PACS which proves that risky borrowers are not avoided during the time of forming group by Primary Agricultural Credit Society or by other rural households who also wants to join that group. Higher income from other sources of the sample households decreases the possibility of a rural household to take direct membership of PACS but that factor does not play any role at the time of taking decision of forming self-help group. Again higher age and high education level discourages a rural household to join self-help group or is not preferred as a member of that group by other co members. Actually the opportunity and the ability to save in small amounts such as Rs. 10 per month motivate the individuals to join self-help group. The other reason is being able to borrow at much lower rates of interest without any collateral. But there are individuals who do not want to face the peer pressure and group dynamics and hence prefer not to join joint liability loan contract even though there is an advantage of avoiding the crunches of professional money lenders and getting loans at lower rates of interest without collateral.

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#### End Notes:

1. The Chief executive Officer of the District Central Cooperative Bank Ltd is the convener of the meeting of District Level Technical Committee. The other members of the Technical Committee are Principal Agricultural Officer of the District, Krishi Sech 'O' Samabyay Member of Zila Parishad, District Development Manager, NABARD, Lead District Manager, Chief Executive Officer of the District Central Cooperative Bank, Chairman of District Central Cooperative Bank, Assistant Registrar of Cooperative Societies of the Range and some seven to eight Progressive Cultivators of the District.

2. For example, for Aman paddy, the loan is sanctioned in April and the loan has to be repaid by 31<sup>st</sup> March of next year. For Boro paddy, the loan is sanctioned during January – February but till 31<sup>st</sup> July existing rate of interest is charged and beyond 31<sup>st</sup> July PACS charge an overdue of 2% interest rate along with the existing rate of interest. For potato, the loan is usually sanctioned during October and hence has to be repaid by 30<sup>th</sup> September of next year. But if the loan is repaid by 30<sup>th</sup> June then the existing rate of interest prevails. Beyond 30<sup>th</sup> June the rate of interest will be 2% more than the existing rate even though it is within the repayment period. This is because it is expected that cultivators are able to earn their revenue from the sale of proceeds by June. If the cultivator is unable to repay the loan by 30<sup>th</sup> of September then an overdue of further 2% rate of interest along with the already prevailing one is charged. Crop-wise repayment period prevailed before the introduction of KCC. The repayment period for Boro paddy, Aman paddy and potato are six months, eight months and four months respectively.
3. Actually our ultimate target was to identify the impact on rural participating households after joining microcredit program operated through PACS. If we want to study the impact, the time gap after joining the program should be at least three years. Here we consider the time gap of four years. So the base period is 2004 where the sample respondents had joined either SHG under PACS to enjoy the benefit of joint liability credit contract in future or became direct member of PACS to enjoy credit under individual liability. We also had to take sample of the non-participants from almost same socio-economic community who are here treated as reference category. The survey was done on 2005-2006 to minimize the recall period.