CHAPTER 4

METHODOLOGY – SAMPLE SIZE AND DESIGN
Introduction
The previous chapters dealt with literature review and research questions. The literature review gave an insight into the topic under study by presenting what had been established by several scholars in regard to evaluation of microfinance through formal and semi-formal financial institutions i.e., Micro finance Institutions or more specifically, microfinance system operated by PACS. There was no specific literature on the evaluation of microfinance in the two blocks of Hooghly district i.e., Chinsurah-Mogra and Tarakeshwar. A research on Tarakeshwar block has been carried out by Jan Meissner (2006) in collaboration with NABARD but no literature was available. There was no extensive research work on Chinsurah-Mogra block and therefore this research would provide one of the references that would be available to guide other scholars and researchers. In this chapter the methods used to get to the findings are discussed. The study was aimed at understanding the effectiveness of microfinance programme, the factors that influence an individual to become a member of PACS or join self-help group or stay away from both of them. It also focuses on the financial performance of PACS and commercial viability of crop insurance. The research process that was used is presented in this chapter. It explains the methods used to collect data; how respondents were selected and how findings were arrived at. In addition a discussion of how the data was processed and analysed is presented. Lastly it is also explained why a particular research methodology was used.

Research Design
The research is largely in-depth and quantitative in nature. The study includes both quantitative and qualitative methods of data collection to capture the adequate information in details. The researcher employed qualitative method of research because there was need to interact with the micro-credit beneficiaries as well as to ensure that specific information was obtained from particular respondents. The use of interviews was relied on to collect the qualitative data. The interviews were used to collect data from the key informants in the study. This approach is supported by Weinriech (2006), who points out that qualitative research methodology are designed to provide the researcher with the perspective of target audience members through immersion in a culture or situation and direct interaction with the people under study. He elaborates that qualitative methods used include observations, in-depth interviews and focus groups and these methods are designed to help researchers understand the meanings people assign to social phenomena and to elucidate the mental
processes underlying behaviours. Researchers like Smith (2008) mention that qualitative methods include the researcher’s experience through techniques such as focus groups, case studies, interviews and personal observation. The use of this method hinged on its benefits/advantages to social science research. The researcher also used this method in order to gain more insight and understanding of the topic of microfinance. This is emphasised by Smith (2008), who states that the main purpose, and therefore, advantage of qualitative research is to provide a richer and deeper understanding of a problem or question being observed. Although subjective, qualitative research methodology provides different ways of looking at the same problem. Without this understanding, researchers can only answer the question of how and not why (Smith 2008).

In this study, the researcher also used a sample and the data was presented in numerical figures and tables. This approach is recommended by York (1998), who explains that quantitative research is about prediction, generalising a sample to a larger group of subjects and using numbers to prove or disprove a hypothesis. According to Bowling (2002), quantitative research deals with quantities and relationships between attributes; it involves the collection and analysis of highly structured data in the positivist tradition. The researcher used the questionnaires to collect the data from the respondents. The questionnaires were administered to the beneficiaries of the microfinance services. The use of the questionnaire is emphasized by Davies (2000) who reveals that, the traditional empirical quantitative technique is the survey questionnaire, administered to a stratified or random sample of a population, enabling us to draw inferences about the behaviour of a whole population from a smaller (and less expensive) number. The emphasis is on breadth and representativeness, confidence levels and significant tests and all that and algorithms to decide the size of the sample you need to survey to achieve a certain level of confidence in the representativeness of the conclusions (Davies, 2000). The researcher utilized this method because of the various attributes it adds to social science research.

The use of the two methodologies was aimed at obtaining reliable, valid and logical conclusions to the research findings. The baseline data got through the qualitative method was complemented by the numerical and statistical representation of the quantitative research. There was also in depth understanding of the topic of microfinance by the researcher when the two methodologies were employed. This served to provide inferences and analysis to the issues. This is affirmed by Creswell (1994) who mentions that the
combination of the two approaches helps the researcher to better understand the concept being tested or explored.

**Classification and Sources of Data**

The research includes both secondary data as well as primary data. Secondary data sources are the foundation for which the theoretical and conceptual framework of the research is built. Secondary data on savings and loaning operations for both the systems were collected from the annual reports and balance sheets of respective Primary Agricultural Credit Societies under survey for two time periods – 2004 (t\(^{th}\) period) and 2008 (t+1)\(^{th}\) period to calculate cost of lending microcredit by PACS to understand which loan contract system is more profitable for PACS. Amount of crop loan and SHG loan disbursed and outstanding and the amount of interest paid for borrowing funds from PACS were also collected from the three PACS under consideration as the rate of interest charged by District Central Cooperative Bank Ltd. from PACS changed during the concerned time period as per NABARD guidelines. Interest income earned from crop loan and SHG loan were also accounted for. The different components of direct and indirect costs were taken into account to calculate cost of lending for both individual liability and joint liability loan contract systems. Net profit was thus calculated on the basis of the above mentioned data. To analyse the financial performance for sustainability and efficiency of these PACS, data on operating income from loans and investments, operating costs, financing costs, loan loss provision, unpaid loans overdue for greater than 90 days, principal amount collected, principal amount due, prepayment and average outstanding portfolio were collected from the balance sheets of respective PACS.

To test the commercial viability of crop insurance scheme by PACS in the two blocks of Hooghly district of West Bengal during disaster years, secondary data on average administrative cost per insurance contract, average indemnities paid and average premiums collected on an insurance scheme were obtained for the disaster year of the respective PACS. In order to calculate the indemnity, data on guaranteed yield or threshold yield, actual yield and sum insured of the farmers were collected from the respective PACS for the time periods 2004-05 to 2011-2012. For examining the performance of crop insurance of these PACS to understand whether farm income has stabilized as a result of it, data on areas covered for cultivation, number of farmers covered, sum insured, premium collected, claims paid, sum
Primary data sources were also used as it forms the bedrock of explanations, inferences, comparisons and recommendations for this research. Much emphasis was placed on collection of accurate and reliable data so as to come up with objective evaluations and to make informed conclusions and judgments. The research techniques used for primary data was interviewing members of individual and joint liability loan contract system. Other than the members, the SHG coordinators and managers of the PACS under study were also interviewed. These interviews were in-depth and open ended so as to be able to solicit independent and objective information as possible. The key questions largely rotated on the following research questions, i.e., factors influencing an individual to join a microfinance programme or stay away from them, quantitative and qualitative effectiveness of microfinance programme. The second, third and fourth objectives of this research consider primary data as their data source.

**Sample Selection and Sample Size**

The study employed purposive sampling method. This is deliberately a non-random method of sampling which aims to sample a group of people or setting with a particular characteristic. The sample is selected on the basis of individual judgement of the sampler. There is no special technique for selecting a purposive sample. The respondents are selected because they have knowledge that is valuable to the research process. This ensured that the respondents who had participated in the microfinance programme and all those who did not were selected. The sample is drawn from Hooghly district of West Bengal. Out of 18 districts in West Bengal, the cumulative number of SHGs provided with bank loan and the cumulative amount of bank loan disbursed was largest in Hooghly. As on 31 March 2005, the cumulative number of SHGs provided with bank loan and the cumulative amount of bank loan disbursed in Hooghly was 14,589 and Rs. 189.67 million respectively. (Source: Progress of SHG –Bank Linkage in India 2004-05, NABARD). This is the reason why the sample is drawn from Hooghly district of West Bengal. 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. Among all the DCCBs in Hooghly, Hooghly District Central Cooperative Bank Ltd. (HDCCB) had the maximum number of SHGs (cumulative) provided with bank loan, and the cumulative amount of bank loan disbursed by HDCCB was also the largest as on 31 March 2005. They were 13900 and Rs. 176.02 million respectively. (Source: Progress of SHG –Bank Linkage in India 2004-05, NABARD). This Bank is the highest lending financial institution among all the banks including any nationalized bank in Hooghly. The credit plan for agriculture and allied activities were targeted at Rs. 8343.71 lakhs in 2005-06 and 95.85% was achieved. The cumulative issue of KCC loan till 2005-06 was Rs.7036.17 lakhs and the cumulative number of KCC cards issued till 2005-06 was 89356 (Annual Report of Hooghly District Central Cooperative Bank Ltd.). 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. At the end of that financial year it was estimated that the repayment rate of borrowing under joint liability was 98%. (Annual Report of Hooghly District Central Cooperative Bank Ltd.). Thus the reason for selecting Hooghly is justified.

Out of eighteen blocks in Hooghly two blocks have been selected randomly for the survey. The selected blocks are Chinsurah-Mogra and Tarakeshwar. Both the blocks have tribal based communities with a considerable percentage of people lying below the poverty line. Chinsurah-Mogra has two PACS affiliated to Hooghly DCCB Ltd - (i) Digisui Union Large Sized Primary Cooperative Agricultural Credit Society Ltd. and (ii) 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 5th March 1957 at Digisui catering to the needs of 13 villages – Digsui, Khalsi, Gannegarh, Bagri, Daharchakulai, Mamudpur, Kabirhati, Naksha, Fatehpur, Taragun, Champarui, Aashphal and Rajarambati. Till 1975, this society provided only agricultural credit but since 1976 provisions were also made for other loans like loans for allied activities, pledge loans against ‘Kisan Vikas Patra’, loan against ‘term deposits’ etc. Since 1996, SHG loan is also being provided by the society. The society also has four Farmer’s Clubs since 1996. These clubs help in production of seeds of paddy, potato, mustard and oilseeds. The club members impart training to the farmers regarding production and preservation of seeds which are provided to the farmer’s club by the
government. Talandu Sech ‘O’ Samabyay Unnayan Samiti Ltd. was formed on 26.12.73. It covers two villages – Talandu and Bharatpur. The main objective of this society was to provide agricultural loan and make provisions for irrigational facilities like all other Primary Agricultural Credit Societies till 1995. Since 1996, this society started accepting deposits from public and granting other loans which include loans for allied activities like poultry, animal husbandry, fishery, dairy etc. Loans were provided for the purchase of power tiller and setting up of grocery shop. Before the introduction of Kisan Credit Card Scheme crop loans were usually short-term loans. But with the introduction of KCC, medium term crop loans were also provided by this society. Land acts as the collateral for short-term loans and medium-term loans. The main crops grown are Aman and Boro paddy and some potato. Term loans are also granted against National Savings Certificate, Kisan Vikas Patra and fixed deposit with the society. Recovery of loans has been to the extent of 90% on an average. The other facilities provided by this PACS are- sale of fertilizers and insecticides, sale of potato seeds and paddy seeds, sale of jute sacks for storing purposes and purchase of paddy from farmers at the market rate for selling them to the traders thus helping farmers to market their produce if they themselves are unable to do so. This society had formed one Farmer’s Club on 20.03.03 named ‘Udayan’ which is not effective. SHG loan has been introduced in this society since 1998. In Tarakeshwar there are eighteen PACS out of which one is chosen and it is known as Vivekananda Samabyay Krishi Unnayan Samiti Ltd. It has the maximum number of savings-linked and credit-linked groups. Incidentally this society was awarded for having the best ‘Farmer’s Club’ of West Bengal by NABARD during 2004-05. This society was formed on 17th September 1977. It covers five villages – Kanaria, Mohonbati, Nacchhipur, Tullyan and Champadanga. Till 1985, the society had the power to disburse agricultural credit only. The different types of loan disbursed by this society are salaried loan, pledge loan and SHG loan along with crop loan. SHG loans are also provided by this society since 1999. The society also provides other facilities to farmers other than agricultural loan like provision of agricultural inputs to farmer at subsidized rates, production of seeds (potato and paddy) and providing them to farmers at minimum rates, testing of soil, transport facilities to farmers at subsidized rates to transfer their agricultural product to the market, production of bio fertilizers and vermicompost and consultancy services to farmers regarding purchase of seeds. The society also has formed two ‘Farmer’s Clubs’ since 2002. Both the ‘Farmer’s Clubs’ are registered under this society. The ‘Farmer’s Clubs’ provide assistance to the farmers regarding buying of seeds. 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 loans disbursed through SHGs are 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. 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 sample was not selected randomly because a specific time period was chosen. The number of individuals who joined individual liability loan contract under PACS in 2004-2005 was first selected and then a sample was drawn from each of the three PACS. The accounting year 2004-2005 (t\textsuperscript{th} period) is considered as the base year in this research. Considering all the three PACS, out of 160 members 115 were selected on the basis of availability and easy communication. For joint liability loan contract system, all the groups that were formed during 2004-2005 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. Only the women SHGs were considered. 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\textsuperscript{th} 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\textsuperscript{th} 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 programmes are arranged by PACS for the target group to create self employment opportunities for the target group. 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.

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. 100 individuals were surveyed who did not join any of the loan contract systems in the $t^{th}$ period. These individuals belonged to the same socio-economic status as that of the members of individual or joint liability loan contract system. The comparatively affluent class such as school teachers, large farmers, businessmen, other salaried people such as managers of PACS, employees of private firms was not included in this group. These people did not join any of the loan contract systems but they were not included in the survey as members of control group for the purpose of unbiased comparison. The survey was carried out twice. The first survey period was from August to November in 2005-06. This period was chosen to minimize the recall period of each respondent. The second survey period was from September to December in 2007-08. The second survey was carried out to study the economic and social impact of microcredit among the members of individual liability and joint liability loan contract system. The end
line of the field investigation is the accounting period 2007-2008. 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 Multinomial Logit Regression and subsequently the effectiveness of microcredit was analyzed using first – differenced method with the help of a well framed detailed questionnaire. But before studying the impact, sample selection biasedness was checked using two-step treatment effect model. Thus the sample has three categories:

1. Individuals who have taken direct membership of PACS in the t\textsuperscript{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\textsuperscript{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\textsuperscript{th} period but can join any of the systems. These sample respondents belong to control group.

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 belonged to both the loan contract systems in 2004. There were no dropouts from either of the treatment groups in the \((t+1)\textsuperscript{th}\) period and therefore the number of participants interviewed during the first survey were also available for interview as a member of the treatment group during the second survey. No individual from the control group joined either of the systems during the concerned time period. They continued to remain as members of control group in \((t+1)\textsuperscript{th}\) period. The sample size of each group and thus the total sample size remained the same in the \((t+1)\textsuperscript{th}\) period.

**Scope and Limitations of the Study**

The scope of the study is limited to the two blocks of Hooghly district and three Primary Agricultural Credit Societies. It includes an empirical analysis of the evaluation of microfinance programme operated by PACS only. The sample respondents include individuals who have become members of PACS or self-help groups in 2004 -2005.
Methodology Applied
The research used the two approaches of qualitative and quantitative research to generate data that is used to evaluate the role of microfinance programme in the two blocks of Hooghly district. The interviewing and questionnaire tools were used for data collection and the data was later analysed using Multinomial Logit and Probit models, first-differenced method, Principal Component Analysis that established conclusions for the research. Multinomial Logit Regression is used for the second research objective i.e., determining the factors that influence rural household to link himself/herself directly with Primary Agricultural Credit Societies for credit contract under individual liability micro-credit contract or to take the initiative to join self-help group under Primary Agricultural Credit Society so that if required he (she) can take credit under joint liability credit contract. The techniques of multinominal logit model can be employed to study such situations where the regressand is unordered. For this research objective, there is a choice between joining individual liability or joint liability loan contract system or staying away from the two systems. Although these are categorical responses, there is no ranking or order here; they are essentially nominal in character. The technique employed for the impact study i.e., the third research question is the first differenced method. This methodology is applied when the data arise from a natural experiment i.e., when an exogenous event – often a change in government policy changes the environment in which the individuals or families operate. A natural experiment always has a control group which is not affected by the policy change and a treatment group which is thought to be affected by the policy change. For the third research question i.e., investigating the effectiveness of microfinance programme operated by PACS in improving the economic conditions of members of individual liability and joint liability loan contract system, the two treatment groups are compared vis-à-vis the control group to study the impact for which two years of data were required, one before the policy change and after the change. To do the impact evaluation, we have to depend on ‘Quasi Experiment’. We know that in a ‘Natural Experiment’ the ‘treatment’ varies through some naturally occurring or unplanned event which happens to be exogenous to the outcome. This experiment has the ability to make comparisons – either overtime or to a group that did not get the treatment. But sometimes ‘treatment’ that may influence outcomes do not just happen naturally – they are implemented precisely to influence outcome. Since evaluation of the programme occurs after targeting decisions have already been made, the researcher cannot randomly assign people to treatment and control groups. ‘Quasi Experiments’ are found here – studies of planned or intentional
treatments that resemble randomized field experiments but lack full random assignments. So there is a difference between ‘quasi experiment’ and ‘natural experiment’ because in a ‘quasi experiment’, the programme or treatment is consciously implemented to produce some changes. But before the impact study is carried out, it is necessary to check for sample selection biasedness because this is a nonrandomized study. Sample selection is not considered a problem in randomized experiments because randomization renders selection effects irrelevant. Hence, the treatment effect model is applied to check for sample selection problem. In order to understand the effectiveness of joint liability microfinance programme in empowering rural women socially and economically, women empowerment index is first estimated using Principal Component Analysis. Principal Component Analysis is preferred for model building because this method attempts to reach a set of factors which can account for all the common and unique variance in a set of variables (Garson, 2003). The goal of PCA is to summarize the interrelationships among a set of original variables in terms of a smaller set of orthogonal principal components that are linear combinations of the original variables. Therefore while choosing the variables we have kept in mind that all variables describe a common phenomenon. After estimation of the women empowerment index, the study involves the use of difference-in-difference estimator for understanding the effectiveness of joint liability microfinance programme in empowering rural women socially and economically. This methodology is applied because the data for this research arises from a natural experiment. For evaluating cost of lending to understand which loan contract system is more profitable, the direct and the indirect costs are calculated first and then the profit and loss is accounted for using components such as operating income and operating expense. Then, financial performance of PACS is analysed on the basis of sustainability, asset quality and efficiency. To test for the commercial viability of crop insurance, viability and sustainability of an insurance contract is checked for the disaster years using a condition followed by Hazell (1992). To analyse the financial performance of PACS, overall loss ratio was calculated using data on premium collected, sum insured, claims ratio, claims paid, premium/sum insured, claims/sum insured etc.

The following chapters include the research work carried out with respect to each research question. Each research question is backed by a well–framed questionnaire to explore in to that area thoroughly and give a definite conclusion. The next chapter includes the first research question i.e., evaluate cost of lending microcredit by PACS to individual liability as well as joint liability loan contract system and analyse the financial performance of these
PACS in order to achieve the objective of understanding which system is more profitable for PACS. In order to answer this research question, secondary data collected from annual reports and balance sheets of respective PACS have been made use of.