2. RESEARCH METHODOLOGY

2.1. INTRODUCTION

Research is commonly known to be search for knowledge. Research is an art of scientific search for specific information. According to Clifford Woody, “research comprises defining and redefining problems, formulating hypothesis or suggested solutions, collecting, organizing and evaluating data, making deductions and reaching conclusion and further testing the conclusions to determine whether they fit the formulating hypothesis”. Research Methodology is a scientific and systematic way of finding solutions to a problem.

In the present study, researcher has gone through various steps as mentioned above, to analyse the research associated problem along with its reasons.

For undertaking any kind of research, researcher must know various research techniques like mean, mode, median, frequency distribution, standard deviation or CHI-Square and need to analyze that which of these techniques are relevant to his or her research. Thus for any systematic research study, a scientific approach is necessary. It was therefore, essential to conceive and plan a systematic design to arrive at an appropriate
conclusion. All the business undertakings are operating in the world of uncertainty, but research design, more than any other procedure, can minimize the degree of uncertainty to a greater extent.

### 2.2 OBJECTIVES OF THE STUDY

1. To study the evolution of the crop insurance scheme in India
2. To review the current status of National Agricultural Insurance Scheme in Maharashtra
3. To examine the present status and prospects of National Agricultural Insurance Scheme
4. To study causes for shortcomings in implementation and suggest required improvements in respect of National Agricultural Insurance Scheme

### 2.3 HYPOTHESIS OF STUDY

Though the farmers get the financial support by way of subsidy in premium and financing of a portion of claim from State and Union Government, the existing status of participation of farmers (both loanee and non-loanee) is not adequate and
there exists a greater scope for the same by increasing the level of awareness among the Indian farmer.

2.4 RESEARCH DESIGN

Research design is an outline of research study which indicates that what researcher will do from writing the hypothesis and its operational implications to the final analysis of data. “A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure”\(^1\). Research design constitutes decision regarding what, why, where, when and how concerning an inquiry or a research study. Overall research design may be divided into the following parts.\(^2\)

a. Sampling Design: This deals with the method of selecting items to be observed for researcher’s study

b. Observational Design: It relates to the conditions under which the observations are made.

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\(^1\) Clair Selltiz and others, Research Methods in Social Sciences, (1962), pg. 50
\(^2\) C.R. Kothari, Research Methodology, Methods and Techniques, New Age International (P) Ltd., Second Edition (2004), pg. 31
c. Statistical Design: It is concerned with the questions of how many items are to be observed and how the information and data gathered are to be analyzed.

d. Operational design: It states the techniques by which procedures specified in the sampling, statistical and observational designs can be carried out.

2.4.1 DETERMINATION OF THE REQUISITE DATA

Keeping in mind the broad objectives of the study, it was first attempted to identify the data / information requirements which included:

1. Statistics relating to NAIS crop insurance scheme.
2. Findings of the various research studies already conducted on NAIS.
3. Initiatives taken by Central and State Government of India based on the recommendations of the various committees / study groups with special reference to NAIS.
4. Problems in implementation of NAIS as experienced by Implementing Agency, Financial Institutions, Department of Agriculture, Agricultural Statistics, Directorate of Economics and Statistics, Department of Co-operation,
Revenue Department of the State Government and Farmers.

5. Experiences of NAIS by Financial Institutions, the Department of Agriculture, Implementing Agency and Farmers.

6. Views and suggestions of NAIS by Financial Institutions, Department of Agriculture, Implementing Agency and Farmers.

7. Strategies to implement NAIS to the grass root level, farmers who are the beneficiaries based on the views and suggestions of Financial Institutions, the Department of Agriculture and the Implementing Agency.

2.5 SAMPLING DESIGN

A sample design is a definite plan for obtaining a sample from a given population. No researcher can study the entire population and hence selects a few individuals belonging to a population for the purpose of his study. These selected individuals form a sample and while selecting these individuals the researcher should consider the following facts:
a) the definition of the population

b) size of the same, and

c) representativeness of the sample.

There are different types of sample designs based on two factors such as representation basis and element selection technique. For representation basis, the sample may be Probability or non-probability sampling. Probability sampling relates with random selection while non- probability with the non-random sampling.

This present study was based on analysis of primary and secondary data. The sample size consisted of data collected from Districts, Talukas and Villages in Maharashtra State.

In India, average number of farmers covered under crop insurance scheme is 18 Million per year. In case of Maharashtra State, the cumulative coverage of farmers is 27920916 (farmers covered under Kharif 2000 - 2010 is 25311915 and farmers covered under Rabi 1999 – 2010 is 2609001).

Though the farmers covered in India are in Crores (25 Million, as on 2010) the researcher selected random sample design of data of farmers for study.
Having considered the average number of farmers participated in the NAIS for an agriculture year (2008, 2009 and 2010) which comes to a cumulative number of 2955689 farmers in Maharashtra. The researcher selected a random sample of 669 (0.022%) farmers for the study (Please refer Chapter 6, Table 20).

2.5.1 RANDOM SAMPLING METHOD

Probability sampling is also known as ‘random sampling’. Under this sampling design, every item of the universe has an equal chance of inclusion in the sample. The results obtained from probability or random sampling can be assured in terms of probability i.e. we can measure the errors of estimation or the significance of results obtained from a random sample, and this fact brings out the superiority of random sampling design over the deliberate sampling design. Random sampling ensures the law of Statistical Regularity which states that if on an average the sample chosen is a random one, the sample will have the same composition and characteristics as the universe.
Hence, random sampling is considered as simplest possible sampling method and is most appropriate when the population is more or less homogeneous with respect to the characteristics under study. Keeping this in view the researcher used random sampling method for selection of a sample for the present study.

To ensure reliability of the results, the Maharashtra State level primary analysis data was collected for 3 Rabi and 2 Kharif seasons viz., Rabi 2008, 2009 and 2010 and Kharif 2009 and 2010 and was based on crop statistics for the period December 2008 to December 2010. The secondary data analysis covered 21 crop seasons for the period Rabi 1999, Kharif 2000 to Kharif and Rabi 2010, covering all the thirty one districts predominantly engaged in agriculture. The Greater Bombay district (comprising of Mumbai City and Mumbai Sub-urban) was excluded from the purview of the study.

Sample size consisted of Maharashtra State and 33 Districts of Maharashtra. Out of 31 Districts, 24 Districts were covered by personal interviews. The farmers in other 7 Districts viz. Yavatmal, Wardha, Nagpur, Bhandara, Gondia, Chandrapur, Gadchiroli were covered by telephonic interviews. Considering the importance of the sampling in the study, care
was taken to identify the sample which was true representative of the class. Thus, farmers in each District two or more Talukas and villages with high and low participation, irrigated and non-irrigated area covered under NAIS were selected on random basis to get information about their experiences and views about NAIS. From the identified Taluka / Villages a sample of 5-10 farmers, loanee and non-loanee were randomly selected.

Primary data was collected from 669 farmers out of which 355 (52%) were loanee and 314 (48%) nonloanee (small, middle, large) farmers. Data was also collected from 114 financial institutions - 67 (59%) District Central Co-operative Banks (Head Office, Branch Offices), 5 (4%) Nationalised Banks (Head Office, Branch Offices), 4 (4%) Gramin Banks, 7 (6%) Primary Agricultural Co-operative Societies and 31(27%) from Agricultural Departments (District and Taluka Offices) of Maharashtra State.

Besides, field investigations, the researcher also relied on discussions with experts, Government functionaries from agriculture department, bankers, academicians and farmers representatives. The researcher had the benefit of detailed discussion with the Chairman-cum-Managing Director,
Regional Manager and the staff of Agriculture Insurance Company of India Limited on more than one occasion to develop a clear understanding of the dynamics of the scheme since its inception to date.

2.5.2 OBSERVATION DESIGN

This deals with different data collection methods. For data collection, the researcher used primary and secondary sources of data. A survey method was used by the researcher for collection of primary data.

2.5.3 COLLECTION OF PRIMARY DATA

Primary data are those which are collected for the first time and which could be original in character. The secondary data are those which have already been collected by someone else and which have already been passed through the statistical process.

There are several methods of data collection, particularly in descriptive researches. This includes following methods.
2.5.4 OBSERVATION METHOD

In research design, many times the observation helps the researcher to reduce complexities and to make the research work more fruitful. When observation is used for research purpose; it becomes a scientific tool for data collection and it serves for a formulated research purpose. Under the observation method, the information is sought by the way of investigator’s own direct observation without asking from the respondent. The advantages of this method is; information obtained through observations relates with current happenings, subjective bias is eliminated, is independent of respondents and relatively less demanding for active cooperation from others. The limitations for this method are; information provided is limited, some obstacles created may be for unforeseen factors and may hamper data collection effectively if concerned resources are not directly accessible³.

Observation method was useful for the researcher in order to design and formulate the questionnaire.

Three questionnaires were designed to collect information as follows:

1. Loanee farmers
2. Non-loanee
3. Officers of Banks, Agriculture Department and Implementing Agency (Agriculture Insurance Company of India Limited) dealing with NAIS.
4. Primary data was collected through questionnaires administered through personal and telephonic interviews. The questionnaire used in the field survey is included in Appendices 1, 2, 4, and 5.

A separate set of questionnaire was used to elicit desired information / their opinion and suggestions for improvement of NAIS from officials of Nationalised Banks, District Central Co-operative Banks, Gramin Banks, Primary Agricultural Co-operative Societies, District and Taluka Agriculture Departments and Agriculture Insurance Company Of India Limited which is included in Appendices 3 and 6.

2.5.5 INTERVIEW METHOD

This type of data collection method needs direct interaction with the respondents. This interaction involves presentation of oral- verbal stimuli and response in terms of
oral-verbal communications. The method of collecting information through personal interviews is usually carried out in a structured way. This method can be used through personal interview or telephonic interviews. Personal interview requires interaction between minimum two people where one is interviewer while the other could be an interviewee. This generally involves face to face contact with direct or indirect personal or group investigation. For telephonic interview information is collected by the interviewer on telephone itself. This is the cheapest, fastest and flexible method.

This method was also of great help to the researcher as she could fill up some of the questionnaires through the direct interviews with the respondents like beneficiaries, non-beneficiaries, officers from banks, agriculture department. The Researcher had some informative discussions during this interview process. This method was also found to be very useful for the researcher for Pilot survey.
This method of data collection is quite common and popular and it is applicable for detailed enquiries. Questionnaire is a set of questions focused on specific topic or specialized area. This questionnaire can be divided into subsets depending on the subtopics of specialized area. This method is generally adopted by research workers, private and public organizations, as well as government organizations also. In this method, usually a questionnaire is sent to a respondent with a request to answer the questions and return the questionnaire. The respondents have to answer the questions on their own. As this is the era of information technology, the method of collecting data by mailing the questionnaires is most extensively employed in various economic and business surveys. The major advantages of this method are no geographical constraints for global survey, low cost; respondents get sufficient time to go through questionnaire and can handle large samples in order to get reliable and precise results. The only major disadvantage is that it is time-consuming as compared to other methods of data collection where constant follow-up is needed.
The above mentioned method of data collection was adopted by the researcher considering the advantages as discussed above.

Primary data was collected during December 2008 to December 2010 from total 669 loanee and nonloanee (small, middle, large) farmers and together covering 114 Nationalised Banks, District Central Co-operative Bank, Gramin Bank, Societies and Agricultural Departments of Maharashtra State. The main objective of the field survey was to get first hand information and perception of beneficiaries, non-beneficiaries, banks and agriculture departments about the NAIS.

Primary data was collected through questionnaire, personal and telephone interviews. Three questionnaires were designed to collect information from loanee, non-loanee and officers of Banks, Agriculture Department and Agencies dealing with NAIS.

Data was collected on random sample basis all over Maharashtra State by interviewing the farmers who have been covered under NAIS, called beneficiaries (loanee) and farmers who were not covered under the crop insurance (non-loanee), Officers from National Bank for Agriculture and Rural Development (NABARD), Managers, Branch Managers,
Administrators, Inspectors, Field Officers, Field Inspectors from District Central Co-operative Bank & Nationalised Banks, Secretaries of Co-operative Societies, Gram Panchayat Offices, Talathis, District Agriculture Officer, Taluka Agriculture Officer, Krishi Sevaks from District and Taluka Agriculture Departments, Chief Statistician, Government of Maharashtra, Regional Manager, Agriculture Insurance Company of India Limited and Faculty Members of National Insurance Academy.

2.6 COLLECTION OF SECONDARY DATA

Secondary data represents a very powerful tool for the researcher as entire research work is carried out on the basis of secondary data. It is nothing but the backbone of research work. Secondary data is the one which has already been collected and analyzed by someone else. Usually this analyzed data is available in the published form.

Secondary data on NAIS was collected from Agriculture Insurance Company of India Limited, Mumbai Regional Office. NAIS Data was available since Rabi 1999 to Kharif and Rabi 2010 (21 crop seasons).

The researcher made extensive use of statistical (secondary and published) data and detailed information about
crop insurance scheme available with Agriculture Insurance Company of India Limited, Mumbai Regional Office. The performance of the scheme was studied crop season-wise and crop-wise in respect of number of performance indicators, namely, farmers covered, area covered, sum insured, premium collected, subsidy to small farmers, claims made and farmers benefitted.

The researcher also collected data from various sources of information:

a. National Insurance Academy Library, Pune
b. College of Agricultural Banking, Reserve Bank of India Library, Pune
c. Agricultural College Library, Pune
d. Agriculture Insurance Company of India Limited, Mumbai
e. Shreemati Nathibai Damodar Thackersey Women’s University Library, Pune
g. The researcher had tried to study available literature on Crop Insurance from various books, magazines, research papers and newspapers.

h. As studied from the literature on crop insurance it was observed that on the economic front the performance had been pitiable both in terms of the size of the impact of the scheme and equitability of premium collections and claim payments. The researcher also found that crop insurance scheme was having limited reinsurance practices for Agriculture Insurance.

i. Internet browsing websites of

www.ccsindia.org;

www.aicofindia.org

www.isec.ac.in

www.IndiaAgristat.com


www.agris.com

www.censusindia.net

www.agricoop.nic.in

www.cropinsurance.org
2.6.1 VERIFICATION OF THE DATA

The collected data is verified with the support of following characteristics:

- Reliability of Data
- Suitability of Data
- Adequacy of Data
- Instrumentation
- Testing

2.6.1.1 RELIABILITY OF DATA

Reliability means the consistency or repeatability of the measure. Reliability refers to the confidence we can place on the measuring instrument to give the same numeric value when the measurement is repeated on the same subject. Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials. Without the agreement of independent observers able to replicate research procedures, or the ability to use research tools and procedures that yield consistent measurements, researchers would be unable to satisfactorily draw
conclusions, formulate theories, or make claims about the generalizability of their research. Following questions were taken into consideration by the researcher while testing the data.

- Who collected the data?
- What were the sources of data?
- Whether the Methods of data collection were proper?
- At what time the data was collected?
- Was there any bias for compilation?
- What was the degree of accuracy?

Survey research presents all subjects with a standardized stimulus, and so goes a long way toward eliminating unreliability in the researcher's observations. Careful wording, format, content, etc. can reduce significantly the subject's own unreliability.

2.6.1.2 SUITABILITY OF DATA

This relates with appropriateness of data with the suitable enquiry. If collected data does not match with the content of specific research topic, then it is called as
unsuitable data. Partial data can be extracted from the source if the researcher finds it appropriate with the content of research topic. Considering object, scope and nature of research broad study is carried out on the guidelines of research guide.

The responses relevant to the subject matter of study which were received from various respondents were analysed and the inputs / responses which were given by the respondents being irrelevant to the subject matter of study were not considered.

Questionnaire was collected in line with the objectives using a pre-tested structured interview schedule. Based on the methodology and impact assessment framework, data from farmers was collected on following parameters :

- Household particulars
- Land holding particulars
- Annual income
- Total cost of cultivation
- Extent and causes of crop loss
- Awareness of NAIS
- Reasons for not availing NAIS
- Measures for loss compensation
- The media from which farmers required information about NAIS
- Preference of the farmer for a particular service provider for availing NAIS
- Experience about NAIS
- Suggestions for improving NAIS
- Premium paid by the farmer and
- Willingness of the farmers to bear agricultural losses beyond which the insurance company would pay losses, livestock holdings

Questionnaire from Implementing Agency (AICIL), participating Banks and Agriculture Departments were collected on following parameters:
- Farmers participation
- Difficulties in servicing NAIS to farmers
- Role played by bank in awareness and publicity of NAIS
• The opportunity to the bank servicing non-borrower farmers for developing / expanding business relationship
• reasonable premium a farmer can pay
• Provisional collateral security to bank loan portfolio
• Insurance service provider(s) as per the opinion of the banks best suited for non-loanee farmers
• Payment of claims
• Bank’s experience in settlement of claims
• Suggestions to improve awareness of NAIS
• Suggestions for improvement in National Agricultural Insurance Scheme.

2.6.1.3 ADEQUACY OF DATA

Adequacy is nothing but sufficient availability of data. If the level of accuracy required for utilizing the data is not adequate, then the researcher should not use this data for research purpose. The available data had been used by researcher after checking reliability, availability and suitability of data.
For the adequacy of data, the researcher had made pilot survey of farmers, experts, bank officials and identified people who could provide appropriate and adequate information for responding the questions. Not only this, the researcher had also studied the website of the concerned insurance company to check adequacy of data.

2.6.1.4 **INSTRUMENTATION**

Instrumentation can often be viewed as a simple input device or method. This is a process of collection of functions and their applications for the purpose of measuring, monitoring and controlling activities. The structured questionnaire designed by the researcher was the main instrument for handling all the processes mentioned above.

2.6.1.5 **TESTING**

For the test of validity the researcher carried out survey by a pilot test. This test was performed by observations, interviewing officers of the company, bank and discussions with experts in order to check whether the questionnaire was precise or not. Researcher had
convinced the users that the results of this research would be helpful for them in handling the issues related NAIS.

2.7 STATISTICAL DESIGN

Descriptive research involves gathering data that describe events and then organizes, tabulates, depicts and describes the data collection (Glass & Hopkins, 1984). Statistical tools play an important role in research. Statistics helps the researcher in designing the research, analyzing its data and drawing conclusions there from. Statistics is divided into major areas that are Descriptive statistics and inferential statistics. Descriptive statistics deals with development of certain indices from raw data while inferential statistics deals with the process of generalization.

The methods of collecting data for descriptive research can be employed singly or in various combinations, depending on the research questions at hand. Descriptive research often calls upon quasi-experimental research design (Campbell & Stanley, 1963). Some of the common data collection methods applied to questions within the realm of descriptive research includes surveys, interviews, observations and portfolios.
The study undertaken by the researcher was a descriptive type of research.

2.8 TOOLS FOR DATA ANALYSIS

The data, after collection, has to be processed and analysed in accordance with the outline laid down for the purpose at the time of developing the research plan. Processing implies editing, coding, classification and tabulation of collected data. Analysis of data involves a number of closely related operations which are performed with the purpose of summarizing the collected data and organizing these in such a manner that they answer the research question(s).

For the purpose of the present study the researcher had used data analysis tools such as Advanced Microsoft Excel to analyse the data. Data collected was segregated and then consolidated with Microsoft Excel and presented using simple analysis in terms of averages, percentages, tabular analysis and graphs.

Researcher had used statistical techniques / tools such as advanced Microsoft Excel for testing of descriptive hypothesis.
and had presented the data in the form of bar diagrams, pie charts and tables.

2.9 LIMITATIONS OF THE STUDY

Despite dedicated / committed efforts to gather the data that depicted the true scenario, certain limitations seemed to be inevitable. Although the research has reached its aims, there were some unavoidable limitations which have been listed below:

1. The farmers in 7 Districts viz. Yavatmal, Wardha, Nagpur, Bhandara, Gondia, Chandrapur, Gadchiroli could not be accessed in person due to prevailing social disturbance and hence responses were obtained by telephonic interviews.

2. Due to the sensitivity of the issue, few farmers / bank / government officials that researcher approached for gathering the information were sometimes reluctant to provide the same.

3. The time taken for collection of relevant information exceeded the pre-set schedule of two years due to resistance shown by the farmers to open up with their
experience about the performance of the scheme in their respective areas and in few cases their responses were unrelated and were beyond the scope of the study. The similar experience was also observed with the bankers and government officials.

4. In order to get information from the farmers, questionnaire had to be translated into Marathi, the local vernacular language.

5. Keeping in view the geographical spread of the sample population, the cost envisaged for completion of the study was as high as Rs. 1,87,000/- and was considered to be a major constraint on the researcher to fund the same. Hence, Agriculture Insurance Company of India Limited being the major insurer for the scheme was approached for obtaining financial assistance, which supported Rs. 50,000/- for the study.

6. In order to optimize the availability of time and cost, the researcher conducted the study alone and restricted the engagement of manpower for the purpose.

7. The researcher found difficulty in accessing the villages because of its remoteness and non-availability of the
transport system for which the researcher was constrained to limit the strata up to Taluka level.

8. The researcher being a woman found it difficult to travel alone to the far-flung areas of the State vulnerable to social disturbances and to meet farmers in their fields.

9. In view of shouldering various social and official responsibilities, researcher found difficult to maintain a work-life balance. However, the researcher prioritized to devote appropriate length of time by availing periodic leave and ensured optimum efforts for successful completion of the study.