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## UNIT 2 RESEARCH DESIGN AND SAMPLING

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### 2.1 INTRODUCTION

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After going through the earlier unit where you learnt about nuances of quantitative research, in the present unit we will look into the frame work or a blue print that we construct to carry out a research study. This unit discusses ‘why’ and ‘how’ of research design and sampling methods in quantitative research methodology. This understanding will help you in choosing a particular research design and how a sample can be drawn from a given universe so that the research is universal in its finding. Let us look into detail of understanding, formulating, stages and advantages / disadvantage research design. Also, you will read about meaning, types, advantages and limitations of various aspects related to sampling.

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## 2.2 OBJECTIVES

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On completion of this unit, you will be able to:

- Explain the meaning of ‘Research Design.’ and ‘Sampling’;
- Develop a Research Design; and
- Undertake a research study by formulating a research design and applying sampling techniques.

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## 2.3 INTRODUCING RESEARCH DESIGN

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Let us first understand what is meant by research? Research simply means a search for facts, answers to questions and solution to problems. It is a purposive investigation. It is an ‘organized inquiry’. It seeks to find explanations to unexplained phenomenon. But the task of research is sequential process involving a number of clearly delineated steps. For a scientific social research, research design and sampling are two important stages.

Research design consists of series of actions or steps necessary to effectively carry out research and the desired sequencing of these steps. To formulate a specific research problem, constitutes the first step in scientific inquiry. The formidable problem that follows the task of defining research problem is progress in the research work, popularly known as ‘Research design’.

### 2.3.1 Meaning of Research Design

It is important for you to understand that developing research design is a challenge to the researcher because the success of her/his research work is depended on the research design.

Any research is valid when its conclusions are true and verifiable. It is reliable when the findings are repeatable. Reliability and validity of the research require the planning of inquiry, i.e. the detailed strategy of how the research will be conducted. Decisions regarding what, where, when, how much, by what means concerning an inquiry or a research study constitute a research design.

The term ‘design’ means drawing an outline or planning or arranging details. It is a process of making research related decisions before the situation arises. Research design is planning a strategy of conducting research.

It plans as to:

- what is to be observed,
- how it is to be observed,
- when and where it is to be observed,
- why it is to be observed, how to record observation,
- how to analyses interpret observations, and how to generalize.

Research design is thus, a detailed plan of how the goals of research will be achieved.

#### Box No.2.1

*A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to research purpose with economy in procedure.*

In short, a research design is a logical and systematic plan prepared for directing a research study. It specifies the objectives of the study, the methodology and techniques to be adopted for achieving the objectives. It constitutes the blueprint for the collection, measurement and analysis of data and provides systematic plan of procedure for the researcher to follow.

### 2.3.2 Significance of Research Design

- It is a plan that specifies objectives of the study and the hypotheses to be tested.
- It is an outline that specifies the sources and types of information relevant to the research questions.
- It is a blueprint specifying the methods to be adopted for gathering and analyzing the data.
- It facilitates the smooth sailing of the various research operations, thereby making research as efficient as possible yielding maximal information with minimal expenditure of effort, time and money.
- It has great bearing on the reliability of the results arrived at and as such constitutes the firm foundations of the entire edifice of the research work.

### 2.3.3 Advantages of Designing Research

The preparation of a research plan for a study aids in establishing direction to the study and in knowing exactly what has to be done and how and when it has to be done at every stage. Let us look at some more advantages of designing a research.

- It enables the researcher to consider beforehand the various decisions to be made.
- The use of a research design prevents a blind search and indiscriminate gathering of data and guides her/him to proceed in the desired direction.
- A research plan prescribes the boundaries of research activities and enables the researcher to channel the energies in the right work.
- With clear research objectives in view, the researcher can proceed systematically towards their achievement.
- A design also enables the researcher to anticipate potential problems of, operationalization of concepts, data collection measurement etc.
- Research can be conducted in a scientific way as precise guidelines are provided that reduces inaccuracies.
- Wastage of time and money is minimized
- Optimum reliability is achieved.
- Designing helps in giving useful conclusions and theories.

#### 2.3.4 Designing Feminist Research

Researchers categorize research by the kind of data it relies upon, by the kind of analytical tools that are employed upon or by the method of data collection. This is a generalized way of approaching a research. But, feminists argue that this approach is guided by the method rather than the research question. **Ackerly and True (2010, p.122)** discusses feminist approach to research design that entails:

- Being aware of ways of using different kinds of data, tools for analysis and methodologies of structured inquiry.
- Designing research meaning selecting cases, deciding how to measure or assess the concepts under study, choosing best methods for data collection and data analysis.
- Mapping research plan that is doable ( keeping the constraints in mind).
- Setting the plan to a reliable schedule.

##### Box No. 2.2

*For Feminists, research design is one of more creative moments in the research process, one that requires charting one's own course. Ackerly and True (2010, p.123)*

After reading about what is meant by research design, its significance and its advances; and also what is meant by designing feminist research, it is important that you undertake the following exercise to assess your understanding before reading ahead.

**Check Your Progress:**

*Write in your own words a few lines about the meaning, significance and advantages of a 'Research Design'.*

In the following section you will read about different types of research designs that are employed in quantitative research.

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## 2.4 TYPES OF RESEARCH DESIGN

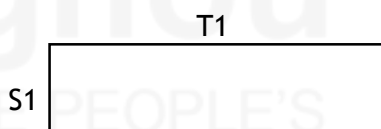
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**Manheim** has pointed out differences in designing three types of research, viz, descriptive, explanatory and exploratory.

**a) Design for descriptive Research :**

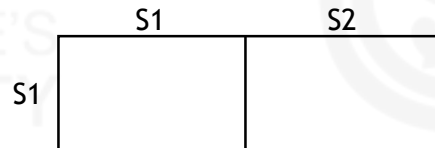
The major goal of a descriptive research is to **describe** events, phenomena and situations. Since description is made on the basis of **scientific observation**, it is expected to be more accurate and precise than causal.

Generally in a descriptive research, the data are collected in a single situation (S) Pertaining to single period (t). This is called 'One-Cell Design' which can be diagrammatically shown as below:



e.g. studying drug abuse among truck drivers in 2009 in Mumbai.

But the study pertaining to one situation or issue can be made in two time periods also as shown in below:



e.g. studying drug abuse among truck-drivers in 2009 and again in 2010. It is known as ‘ex-post facto design.’

**b) Design for Explanatory Research:**

Explanatory or causal research is mainly concerned with causes or ‘why’ factor about some phenomenon. It does not involve comparison and factors of change.

The research design in explanatory study focuses on ascertaining the ‘why’ aspect of co-relationship. e.g. the study of voting behavior of people in parliamentary elections, held in March 2009 and September 2010, were explanatory studies which explained how people so voted because of caste, language, and political ideology, image of candidate etc.

**c) Design for Exploratory Research :**

Exploratory studies are conducted for the purpose of formulating a problem for more precise investigation or for developing hypotheses. An exploratory study, may however, have another function, e.g. increasing the investigator’s familiarity with the phenomena s/he wishes to study in a subsequent, more structured investigation or with the setting in which he plans to carry out such an investigation.

Exploratory research is necessary to obtain experience that will be helpful in formulating relevant hypotheses for more definitive investigation. For a general, area of problems about which little knowledge is available, an exploratory study is most appropriate.

So, exploratory research is mostly carried when there is not sufficient information available about the issue to be studied, or in other words, the researcher has either no knowledge or a limited knowledge.

e.g., study of effect of TV Programmes on Youth.

According to **Babbie** ( 2010) exploratory studies are conducted for the following purposes:

- To satisfy the researchers curiosity and desire for better understanding.

- To test the feasibility of undertaking a more extensive study.
- To develop the methods to be employed in any subsequent study.

Bryman (2008, p.35) discusses five types of research designs namely, experimental, cross-sectional, case study, longitudinal and comparative research design. In the following section we will read about each of them in detail.

### ***Experimental Design:***

Experiment per se are not common in social sciences but are carried out in allied fields like social psychology or in reach on social policy where impact of new reforms or policies need to be assessed. Here, it is important to make a distinction between laboratory experiment and field experiment.

Laboratory experiments take place in a laboratory or in a contrived setting. On the other hand field experiments occur in real life settings. For example, as in case of assessing impact of a reform or a new policy intervention in a class room or in a community. It is more likely that gender studies research will relate to field experiments than laboratory experiment.

Experimental designs can be further classified as:

- **Classified experimental designs:** These are also referred to as randomized experiments or randomized controlled trial. In this type of research design two groups are formed- one control group and the other is known as experimental or treatment group. This group is subjected to the kind of treatment that needs to be studied whereas the controlled group is kept away from the treatment. The importance of controlled group is to rule out any casual finding from the treatment group. This type of research design gained importance in health related field experiments as it helps in comparing the impact of an intervention with a situation of no intervention or comparing impact of various kinds of interventions.
- **Laboratory Experiments:** Here, the researcher has far greater influence over the experimental arrangements. It is easier to subject the controlled group to different experimental conditions in a laboratory than in real life situations. Therefore, lab experiments can more likely to be replicated than field experiments.
- **Quasi-experiments:** There are studies that have certain characteristics of experimental designs but don't fulfill all the requirements of validity. As in case of 'natural experiments', entailing manipulation of a social

setting as a part of naturally occurring attempt to alter social arrangements. But, in such situations, it is generally not possible to assign subjects randomly to experimental and control groups.

***Cross-sectional Design:***

A cross-sectional design entails the collection of data on more than one case at a single point in time in order to collect a body of quantitative or quantifiable data in connection with two or more variables which are then examined to detect patterns of association. (Bryman, 2008, p.44)

Let us examine this definition more closely by discussing various aspects related to cross-sectional design.

The first emphasis is 'more than one case', meaning variation is important, for which more than one case is required. Variation may be on account of type of family, caste, religion, income, rural/urban setting etc. This will help the researcher in making finer distinction among cases.

Next emphasis is on 'a single point of time'. Here, data collection on different variables of interest is done more or less at one point of time only. That is to say, data collection is completed at one point of time and not in stages or in different time spans.

The next point to be emphasized is 'quantifiable data', which is necessary to have a methodical and consistent method for assessing variations leading to reliable point of reference.

Lastly, emphasis is on 'pattern of association'. A cross sectional design makes it possible to study connections between any two variables studied and make it possible to establish patterns of association.

Cross-sectional design is also referred to as 'survey research' about which we are going to deal in detail in the next unit of this Block (Unit 3)

***Longitudinal Designs:***

In longitudinal research design, a study is carried out at a point of time and is surveyed again, at least one more time at another occasion.

It is typically carried out in social sciences disciplines and fields like sociology, social policy and human geography. It is usually an extension of survey research. A longitudinal design allows insight into the time order of variables and therefore let casual inferences to be made. (Bryman, 2008, p.49)

Longitudinal researches can be of two types: (1) panel study where a sample is randomly selected on at least two occasions from different type of cases within the panel framework, may it be people, households, organizations, schools, etc. (2) cohort study where an entire cohort of



people or a random sample of them is selected as the focus of data collection. A cohort comprises of respondents having similar characteristics, for example, woman single parent, female head of household, etc.

Both panel and cohort studies share some similarities like, data is collected on same variables on the same set of respondents at least two different points of time. Another similarity is that both shed light on social change and casual influence over time. Both panel and cohort studies share similar problems too, like problem of sample attrition on account of death, migration or change of residence. Also, there is evidence whereby respondents of longitudinal study show conditioned behaviour as a result of continued participation.

### ***Case Study Design:***

This type of research design calls for a comprehensive and exhaustive analysis of a single case. Stakes(1995) observes, case study is concerned with the complexity and particular nature of the case in question. (cited in Bryman, 2008, p.52) Commonly, a case study is taken as a study of a single location, community or organization.

Let us now look at what is understood by a case. You have read about it in Unit 2, Block II of this course. It is fairly common to associate case study with qualitative research. But, Bryman (2008) argues that case study can be associated with both quantitative and qualitative studies. He cites studies by Breadsworth and Keil's (1992) where they studied vegetarians as cross-sectional design in qualitative research. But, Davies et al.(1994) termed it as 'case study evidence' on the ground that field work was undertaken at a single location.( Bryman, 2008,p.53)

Thus, a case here in quantitative research is '**representative or typical case**', exemplifying a broader category to which it belongs to providing a suitable context for certain research questions to be answered. It can be a '**revelatory case**' the researcher gets opportunity to study a phenomenon that was not accessible to earlier researchers.

A very important critique of this research design is that the finding of a case study cannot be generalized.

### ***Comparative design:***

Here two or more contrasting or diversified cases are studied using more or less identical methods. It is understood that social phenomena can be better studied when observed and compared in relation to two or more significantly distinction cases or situations. This design is generally employed while studying cross-cultural or cross national research studies.

*Hantrais (1996) suggests that such research occurs when individuals or teams set out to examine particular issues or phenomena in two or more countries with the express intention of comparing their manifestations in different socio-cultural settings ( institutions, traditions, value systems, life styles, language, thought patterns), using the same research instruments either to carry out secondary analysis of national data or to conduct new empirical work. The aim may be to seek explanations for similarities and differences or to gain a greater awareness and a deeper understanding of social reality in different national contexts. (Cited in Bryman, 2008, p.58)*

After reading about different research designs described by Bryman, take up the following exercise to assess your understanding.

***Check Your Progress:***

*Write a line or two about each of the research designs that you have studied in the last section.*

In the next section we will read about sampling which is a very significant practice in making the research finding universally applicable, valid and verifiable too.

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## 2.5 SAMPLING

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Now we will discuss another important and useful process of and quantitative research study. It is called 'Sampling'. Sampling is not typical of research only. In a way, we also practice it. In our day to day, we use crude versions of sampling. Housewives for example, judge few grains of boiled rice to see if, it is ready to be served; understandably, it is not feasible to examine each and every grain in the cooking pot. Our day to day experience testifies to the fact that by and large, it is possible to make some kind of general statement about the universe by observing only a few items i.e. a sample. The method of selecting a portion of the universe with a view to draw conclusions about the universe in 'toto' is known as 'Sampling'

Sampling gives meaning and direction to the scientific social research. In this section we will read about what is a sample? What is the technique of selecting a sample? What are types of sampling and lastly what are the limitation and advantages of sampling technique.

### 2.5.1 Basic Concepts and Terms

In following section we will read about concepts and terms that are important to understand before you proceed to read about the process of sampling.

- **Population:** the universe of the units from which the sample is to be selected.
- **Sample:** the segment of the population that is selected for investigation. It is a subset of the population. The method of selection may be based on a probability or a non-probability approach
- **Sampling frame:** the listing of all units in the population from which the sample will be selected
- **Representative sample:** a sample that reflects the population accurately so that it is a microcosm of the population
- **Sampling bias:** a distortion in the representatives of the sample that arises when some members of the population (or more precisely the sampling frame) stand little or no chance of being selected for inclusion in the sample
- **Sampling error:** error in the findings deriving from research due to the difference between a sample and the population from which it is selected. This may occur even though a probability sample has been employed
- **Non-probability error:** error in the findings deriving from research due to the differences between the population and the sample that arise either from deficiencies in the sampling frame or non-response , or

from such problems as poor question wording, poor interviewing or flawed processing data.

- Non-response: a source of non-sampling error that is particularly likely to happen when individuals are being sampled. It occurs whenever some members of the sample refuse to cooperate, cannot be contacted, or for some reason cannot supply the required data (for example, because of mental incapacity).
- Census: the enumeration of entire population. Thus, if data are collected in relation to all units in a population, rather than in relation to a sample of units of that population, the data are treated as census data. The phrase 'the census' typically refers to the complete enumeration of all members of the population of a nation state- that is, a national census. This form of enumeration occurs once every ten years in the India.

(Adopted from Alan Bryman, *Social Research Methods*, Oxford : Oxford University Press, 2008, pp. 168-169)

#### Box No. 2.4

*Sample is the sub-set of the population that is selected for the study. It constitutes of people, events, behaviour or other elements with which to conduct the study. Sample must representative of the entire population . Descriptive attributes of the sample should be specified for homogeneity.*

Let us now read about the guiding principles that govern the process of sampling.

### 2.5.2 Principles of Sampling

The main principle behind sampling is that we seek knowledge about the total units, by observing a few units and extend out inference about the sample to the entire population.

The other important principles of sampling are.

- Sample units must be chosen in a systematic and objective manner.
- Sample units must be clearly defined and easily identifiable.
- Sample units must be independent of each other.
- Same sample units should be used throughout the study.
- The selection process should be based on sound criteria and should avoid errors, bias and distortions.

*A.L. Bowley, whose pioneering work on sampling statistics in the realm of social sciences won him academic and official recognition in the early 19<sup>th</sup> century arrived at certain conclusions by resorting to the method of sampling. According to Wilkinson and Bhandarkar, (1976) Bowley sampled out each group of twenty families for study on family. His conclusions were found, to a considerable extent, consistent with the subsequent findings of Charles Booth and Rowntree who worked on a much more comprehensive canvas. Bowley's work demonstrated very clearly that sampling techniques are effective considerations will regards to economics of time, money and effort. Sampling also afforded worthwhile conclusions. The use of sampling in social science has steadily increased ever since.*

### 2.5.3 Advantages and Limitations of Sampling

Let us now read about what are the advantages of using a sample in quantitative research and how a sample proves to be a limitation in survey research.

#### **Advantage of Sampling Method:**

- It saves money, efforts and time of the researcher.
- Researcher has to study only the elements from the sample so it is very convenient.
- Sample size is limited. So it is easy to understand the whole sample and possibility of deep study.
- Sample makes it easy to predict reliable conclusions.
- It is easy to collect facts which are based on experience.

#### **Limitation of Sampling Method:**

- While researcher is using sampling method for selecting a sample for his/her study, training is required about preparing sampling frame.
- Because of diversity, complexity and changeability, sometimes sample will be prone to errors.

Let us now assess how much you have understood after reading the last section of this unit.

#### **Check Your Progress:**

i) Define the following :

- |                  |                   |                 |
|------------------|-------------------|-----------------|
| a) Population    | b) Sampling       | c) Sample Frame |
| d) Sampling Bias | e) Sampling Error | f) Census       |

*ii) Write principles that govern sampling in any research.*

*iii) Write two advantages and two disadvantages of using sampling method.*

In the following section you will read about different types of sampling that are used in carrying out survey research. We will also discuss their advantages and limitations.

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## 2.6 TYPES OF SAMPLING

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There are basically two types of sampling: probability sampling and non probability sampling. **Probability sampling** is one in which every unit of population has an equal probability of being selected for the sample. It offers a high degree of representation. However, this method is expensive, time-consuming and relatively complicated since it requires a large sample-size and the units selected are usually widely scattered. **Non-probability sampling** makes no claim for representativeness. Every unit does not get the change of being selected. It is the researcher who decides in accordance with the objectives of the study that which sample units should be chosen.

## 2.6.1 Probability Sampling

Probability Sampling today remains the primary method for selecting large, representative samples for social science and business researcher. Probability sampling requires following conditions to be satisfied.

- 1) A complete list of subjects to be studied should be available.
- 2) Size of universe must be known.
- 3) Desired sample size should be specified.
- 4) Each element should have an equal chance of being selected.

### ***Characteristics of Probability Sampling:***

- a) **Prediction:** Statistical determination of possibility of inclusion of unit in sample from the universe is the important characteristic of probability sampling. Suppose there are 500 total respondents in the universe. We are selecting sample of 50 units from it, then the possibility of inclusion of each units in the sample is 10%.
- b) **Reliability:** Level of reliability depends upon real value of universe and sample value. If deviation between the two is more, then possibility of tentative conclusions being wrong will also increase. If the sample size is more then the deviation will be less.
- c) **Accuracy:** It is possible to determine accuracy by statistical method. We can use mean, mode and median to reduce errors.
- d) **Sample Size:** In probability sampling we can predict the possibility of inclusion of units in the sample so the sample in this method is representative.

### ***Advantages of Probability Sampling:***

- It is a scientific method.
- Possibility of statistical determination of inclusion of units in sample from the universe.
- Conclusions are more objective.
- Researcher can avoid biased views.
- It saves time and money.
- It increases accuracy of data.
- It is easy to supervise few interviews in the sample.

**Limitation of Probability Sampling:**

- Researcher should know the characteristics of the whole universe.
- Whenever researcher is using this method for selecting the sample, then researcher should know the of techniques of selecting the sample very well.
- It is difficult to collect the data using probability sampling as it requires more efforts, money and time.

**Box No. 2.6**

*The essential characteristic of probability sampling is that one can specify for each element of the population, the probability that it will be included in the sample i.e. each of the elements has the same probability of being included in the sample. This however is not a necessary condition; what is necessary is that for each element there should be some specifiabile probability that it will be included in the sample. Probability sampling is the only approach that makes possible the formulation of representative sampling plans.*

Now we shall discuss some major forms of probability sampling.

The different types of probability samples are:

- 1) Simple Random Sample
- 2) Stratified Sample
- 3) Cluster Sample
- 4) Multistage Sample

**1) Simple Random Sampling**

In this sampling the sample units are selected by means of a number of methods like lottery method, tippet's methods, and Grid method.

**i) Lottery**

This method involves three steps. First step is constructing the sampling frame i.e. list of the units of the target population. e.g. student's list, the electoral role in alphabetical order and numbered accordingly. Second step is writing numbers listed in sampling frame on small pieces of paper and pacing these papers in some jar. Third step is mixing all papers in Jar and taking out one piece of paper from the jar. This process is continued until the required number of respondents is reached.

**ii) Tippet's table Method**

Tippet's has prepared a table of random numbers. These numbers are available in various forms. Size and number combinations in



the appendix of the texts on statistics e.g., two hundred teachers employed by seven English medium pre-primary schools in the city apply for attending a two-day Seminar. The sponsors, however only have money to pay for 30 participants. The seminar director, therefore, assign each applicant a number from 001 to 200, using a table of random numbers that he found in a statistics book. He select 30 numbers within the range to 001 to 200. The director decided that this method was easier than picking numbers from the urn.

### iii) Grid Method

While collecting a sample from the universe spread over a large geographical area, 'Grid Method' is commonly used. For example, for studying political opinions of voters in any state, number of voters will surely be huge. In this case, voters in the entire state are our universe. To collect samples from this universe, map of the state is taken and squares are drawn on that map. These squares drawn on the map are serially numbered. Few squares are selected amongst them by lottery method. Voters in that area which are selected by above mentioned lottery method are included in the sample. In this manner, sample can be selected from a universe spread over a large geographical area.

#### ***Advantage of Simple Random Sampling:***

The advantages of simple random sampling are given below.

- All elements have equal chance of being included.
- It is the simplest of all sampling methods and easiest to conduct.
- This method can be used in conjunction with other methods in probability sampling.
- Researcher does not need to know the true composition of the population before hand i.e. he requires minimum knowledge of population in advance.
- Degree of sampling error is low.
- Most statistical textbooks have easy to use tables for drawing a random sample.

#### ***Disadvantages of Simple Random Sampling:***

- It does not make use of knowledge of population which researcher may have.
- It produces greater error in the results than do other sampling methods.
- It cannot be used if the researcher wants to break respondents into sub-groups or strata for comparison purposes.

## 2) Stratified Sampling

This is the form of sampling in which the population is divided into a number of strata or sub-groups and sample is drawn from each stratum. These sub-samples make up the final sample of the study. It is defined as the method involving dividing the population into homogenous strata and then selecting simple random samples from each of the stratum.

The division of the population into homogenous strata is based on one or more criteria e.g., sex, age, class, educational level, residential background, religion, occupation etc.

### ***Advantages of Stratified Sampling:***

- Sample chosen can represent various groups and pattern of characteristics in the desired population.
- It can be used for comparing sub-categories.
- It can be more precise than simple random sampling.

### ***Disadvantages of Stratified Sampling:***

- 1) It requires more efforts than simple random sampling.
- 2) It needs a larger sample size than simple random sample to produce statistically meaningful results because each stratum must have at least 20 persons of make statistical comparison meaningful.

There are two types of stratified sampling (1) **Proportionate** (ii) **disproportionate**. The former is one in which the sample unit is proportionate to the size of the population, while the latter is one in which the sample unit is not related to the units of the target population

The advantages of proportionate stratified random sampling are (i) representation is enhanced (ii) sampling error is reduced (iii) comparison of different strata becomes possible.

The disadvantages of these methods are : (i) it is somewhat complex method of determining a sample (ii) it involves more time to obtain elements from each strata (iii) the number of classification errors increases with more strata.

A **stratified sample** is used when the researcher wishes to select a sample with a particular trait or characteristic. That is to say, when the researcher wants to examine the relationship between two variables, a stratified sample is used in research. For example, in a study of women with different levels of income, the researcher selects women randomly with different strata or levels of income. Before randomly selecting the subjects, the researcher divides the population into three levels: low income, middle income and high income. Stratified samples are likely to be more representative on many variables than a simple random sample (Babbie, 1986).

### 3) Cluster Sampling

The usual sampling procedure is to select one element or subject at a time. This is very time consuming and tedious when a large sample is needed. Further, a researcher must have a complete list of the elements in a population which may not always be available. In order to avoid this problem, a researcher selects the sample in groups or categories. This procedure is called **cluster sampling**. In cluster sampling, we can divide the state into districts, revenue divisions and villages and select clusters or groups of people from these areas.

### 4) Multistage Sampling

In nationwide studies where the sample size is large, researchers need to use sampling methods that are more complex than simple random sampling. A form of cluster sampling which is used in more complex survey research designs is called **multistage sampling**. In this sampling procedure, individuals or households are selected, not groups. For example, in a study of the health care available to women in South India, a cluster of districts in the states of South India are selected. This cluster is narrowed down by selecting a revenue division or block within a cluster. Next, the households in the area are listed out for the study. The multistage sample is selected by including the third or fifth household as in systematic random sampling. Multistage samples are useful when comparative studies are conducted to understand the population characteristics in a nationwide survey. The cost of sampling can be reduced if clusters are carefully selected.

Assess your understanding up taking up the following exercise.

#### **Check Your Progress:**

- i) *What are the two types of sampling techniques in quantitative research?*
  
  
  
  
  
  
  
  
  
  
- ii) *Write the main features of simple random, stratified, cluster and multi stage sampling techniques.*

Let us now read about the other type of sampling technique used in quantitative research.

## 2.6.2 Non-probability Sampling

In many research situations, particularly those where there is no list of persons to be studied is available e.g. wife battering, migrant workers, alcoholics, etc. probability sampling is difficult and inappropriate to use. In such researches, non-probability sampling is the more appropriate one.

We have read about characteristics, advantages and limitations of probability sampling, now we will read about characteristics, advantages and limitation of non-probability sampling.

### *Characteristics of Non-probability Sampling:*

- 1) **Non-representative Sample :** In non-probability sampling, representation of sample is very less, because sample size and units selected for the sample depend upon researcher's requirements.
- 2) **Biased Views:** While selecting a sample, researcher may take biased views, which results into inaccurate subjective conclusions.
- 3) **Freedom of Selection of Sample :** In this method researcher enjoys freedom of selecting sample, so it is non scientific.
- 4) **Sample Size:** There is no statistical formula of calculating sample size through non-probability sampling. It is totally dependant on researcher's wish.
- 5) **Level of Errors and Accuracy in Conclusion:** It is very difficult to determine the level of error and accuracy in conclusion.
- 6) **Convenient and Money Saving Method:** Comparatively this method is convenient and money saving for the researcher.

Non -probability sampling procedures do not employ the rules of probability theory and also do not claim representativeness, and are usually used for qualitative exploratory studies. Non-probability sampling are of the following types:

#### a) **Convenience Sampling**

This is also known as 'accidental sampling'. In this sampling, the researcher studies all those persons who are most conveniently available or who accidentally come in his/her contact during a certain period of time in the research. For example, the researcher is engaged in a study of post graduate students might visit the university canteen, library, departments, playgrounds, and interview certain number of students.

The most obvious advantage of convenience sample is that it is quick and economical. Its main disadvantage is, it may be a biased sample.

Convenience samples are best utilized for exploratory research when additional research will subsequently be conducted with a probability sample.

**b) Purposive Sampling**

In this sampling, also known as judgmental sampling, the researcher purposely chooses persons, who in his judgment possess appropriate characteristic required of the sample members, are thought to be relevant to the research topic and are easily available to him. For example, suppose, the researcher wants to study beggars. S/he knows three areas in the city where beggars are found in abundance. S/he will visit only these three areas and interview beggars of her/his choice and convenience.

**c) Quota Sampling**

In **quota sample**, the researcher needs to include a certain proportion of subjects with a specific characteristic or quality. For example, a researcher is interested in finding out how women who have access to internet differ in their television watching habits, may know that only 10 per cent of the total women population have access to internet. Therefore, the sample selected by the researcher may have 10 women who have access to the internet for 100 women selected without access to the internet but watch TV regularly. Surveys to study the incidence of HIV/AIDS among women uses a sample of pregnant women visiting prenatal clinics as this is regarded as the best indicator of infection among the adult population.

**d) Snowball sampling** is used in surveys where the researchers do not have much information about the population. In snowball sampling, the researcher uses the first subject as the connecting link to select the rest of the subjects. For example, in a study of women who had undergone successful family planning operations the researcher contacts a woman who meets this criteria and then identifies other such women from the first subject's contacts. Often this technique is useful when it is hard to locate subjects who meet specific criteria set by the researcher to select a sample. Snowball samples are frequently used in small studies which focus on specific conditions of women's lives such as those with HIV/AIDS, widows or women-headed households who may not be accessible to researchers and are difficult to find.

***Advantages of Non Probability Sampling:***

- Non-probability sampling is useful whenever probability sampling is difficult to use and there is no alternative.
- It saves money and time.
- It is useful in descriptive and exploratory type of researches.

***Limitations of Non-Probability Sampling:***

- While selecting a sample, researcher may take biased views.
- Sample selected by non-probability sampling may not be representative.
- Conclusions drawn from the research can be misleading especially while selecting sample by using convenience method.
- In this method, it is very difficult to state the level of reliability and accuracy.

Take up the following exercise to assess your understanding of the section that you have just read.

***Check Your Progress:***

*i) In which sampling method errors are unpredictable? Explain why?*

*ii) Which sampling method is unscientific? Why is it so?*

*iii) In which research design non-probability sampling is useful.*

In the following section we are going to read about the use and importance of sampling in qualitative research, especially feminist research.

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## 2.7 SAMPLING IN QUANTITATIVE RESEARCH

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Qualitative researchers are generally employing purposive sampling as the selections of units (people, organizations, documents etc.) have to have direct reference to the research question.

Probability sampling may be used in qualitative research for interview based research rather than in ethnographic studies. Qualitative researcher using probability sampling should keep two criteria in mind. That the results be generalized to wider population and if research questions do not suggest that particular categories of unit of analysis should be sampled, there may be a case for sampling randomly.

### Box No. 2.7

#### *Two meaning of 'sample'*

*In statistical research , a sample is a 'portion drawn from a population, the study of which is intended to lead to statistical estimates of the attributes of the whole population' ( Oxford English Dictionary, 2008). The social sciences meaning of "sample" is often intended to be an approximation of the scientific statistical sample, that is, to get a "representative" sample. However, in the studies that use one or few cases, the meaning of sample is better captured in the OED's first meaning, "A fact , incident, story or suppositious case, which serves to illustrate, confirm, or render credible some proposition or statement".*

*These general meanings of 'sample' are quite different. From the statistical sample we expect to learn about the other cases in the population. From the illustrative sample we expect to learn about a phenomenon.*

*Both meanings can be found in feminist research.*

*Adopted from: Doing Feminist Research in Political and Social Sciences. Ackerly and True, 2010, p.127*

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## 2.6 LET US SUM UP

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Research design is a blue print of any research study. It ensures against wasteful expenditure of money, time and energy. To design is to plan, that is, designing is the process of making decisions before the situation arises. It is thus, a process of deliberate anticipation, directed towards bringing an expected situation under control.

The task of designing research is a sequential process involving a number of clearly delineated steps. There are some variations in the number of steps, their names and their sequence suggested by different writers but

design of research and sampling are the most important aspects and inevitable part of the social research.

Sampling is the process of selecting a part of the universe (sample) that represent the whole sampling can be probability sampling where each unit has equal chances of being selected & non probability sample that is not representing the universe in totality. Probability and non probability sampling are of different types. Type of sampling chosen for any research study depends on the purpose and resources (time, financial and human resources) available with the researcher.

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## 2.7 UNIT END QUESTIONS

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- 1) What is research design? Enumerate upon various types of research design discussed in this Unit.
- 2) Discuss types of sampling and describe their advantages and limitations.
- 3) Take up a hypothetical research study, chalk out the research design and sampling method you would like to employ. Give reasons for choosing the research design and the sampling method.

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## 2.8 REFERENCES

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## 2.9 SUGGESTED READINGS

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