UNIT 5 : SAMPLING

UNIT STRUCTURE

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5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- understand the meaning of Sampling.
- explain the different types of Sampling.
- discuss the use of Sampling technique in Social Science Research.

5.2 INTRODUCTION

Normally during any study or research enquiry, some common set of questions come to mind of researcher. For instance, whom will we consider for data collection? Is it the entire population (universe) or just a sample? Here, by population, we mean the entire sets of units of study for data collection. It includes the characteristics of data of a particular research problem that a researcher is willing to study. Whereas, a sample is considered to be the representative of the entire population. In most of the cases, however, it is not feasible for the researcher to conduct a study in the entire population as there are certain limitations involved like funding, time constraint and so on. The sampling procedure depends on the objectives and nature of the study. The sample allows further to generalize the findings on the entire population that has a similar homogenous

characteristics in the group that has been studied. In other words, sample in research allows us to draw conclusion in to the entire set of population based on the objectives of the study. So larger the number of samples, greater is the confidence that we derive from the conclusion and vice versa. However, in selecting a sample from the entire population, one should be careful about choosing how many numbers of sample would represent the population and that has homogenous characteristics of the study area. Often, the disproportionate sample leads to sampling error in research. Therefore, sampling biasness or error can be minimized by following the sets of sampling types that will be discussed in the this unit. In the previous units we have learned about the meaning and types of research and the importance of research design in conducting research. In this unit, we shall discuss about one of the important techniques of data collection i.e. Sampling and its different types. We shall also get to know about the use of this technique.

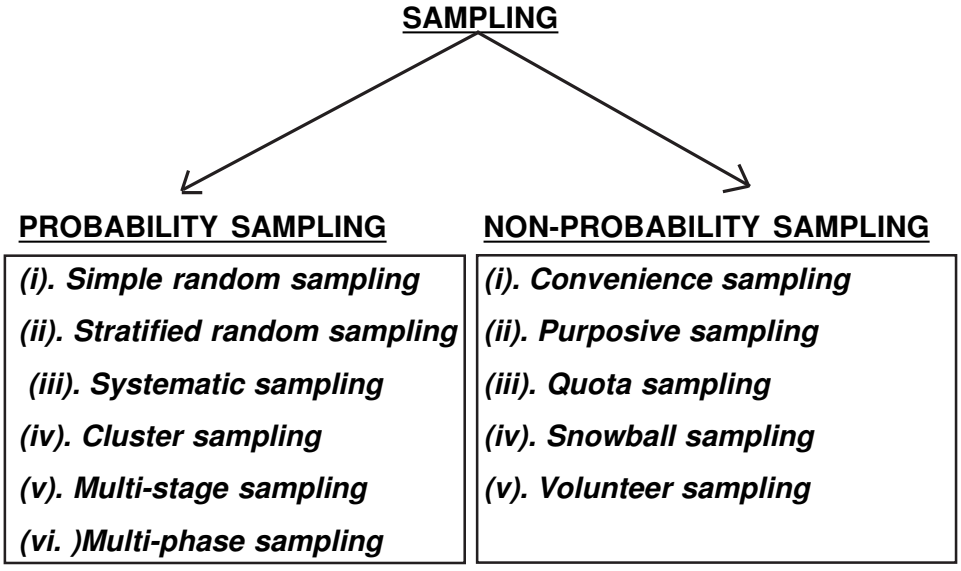
5.3 MEANING OF SAMPLING

Now let us understand the definition and meaning of sample in research. According to Manheim (1977), a sample is a part of the population which is studied in order to make inferences about the whole population. So, a sample is helpful to draw conclusions for the whole population. Now, it is very essential to determine the target groups for collection of sample. Our interest area and objectives of the study will determine a target group of the study. Let us consider an example. Suppose a study is focussing on the women health of a particular area. Now our target group is women. The sampling frame of our study will try to operationalize the sampling structure and method. For example, what kind of women (whether married or unmarried), of what age group, employed or unemployed and so on. The operational understanding of the sampling structure would help to identify relevant sample from the entire population. Normally, for calculation of sample size, following formula is applied to determine the number of sampling units that need to be studied. The formula is $n/1+n\ (e)^2$, where, n is the total number of population and e is considered as the confidence

level, i.e. 0.5. In the earlier example, total number of women in the study area will be the total number of population (universe) for study. This formula is commonly used in order to derive a sample that is representative of the entire population.

5.3.1 Types of Sampling

There are different types of methods of collecting samples for research. Broadly, these types are categorized into probability and non-probability sampling. In simple words, in probability sampling, the respondents get equal chance of getting selected, whereas, in non- probability sampling, the respondents do not get equal chance of getting selected as it is based on the choice and interests of the researcher. The samples of probability sampling possess high degree of representation in the study as it consists of homogenous characteristics of the samples. The kinds of probability and non-probability sampling are discussed below.



➢ **Probability sampling :** Probability sampling is used across study when there is a definite set of data available in the field and is known to the researcher. Under **probability sampling**, there are simple random sampling, stratified random sampling, systematic sampling, cluster sampling, multi stage sampling and multi phase sampling. In ***simple random sampling***, the elements of study get equal chance of getting

selected in the study. Typically, it includes the lottery method where it involves three processes. Firstly, the study area will be identified and listed accordingly. Secondly, the names of every study area will be written in a piece of paper and is put in a box. Later, these sheets will be mixed together and thus will be picked up randomly. In this case, each area gets equal opportunity of getting selected in the study frame and is homogenous in nature. Adding to the simple random sampling technique, now the area that was identified and selected for study will be categorized under certain strata or sub headings like age, gender, qualification and so on. From these categories, equal numbers of sheets will be picked up from each stratum, thus claiming for equal representativeness in the study. This process is known as ***stratified random sampling***. In case of ***systematic sampling technique***, the number of samples will be identified at the first stance. In the process, for the first sample, simple random sampling will be used and it will be continued with selecting the every nth term of the sample list. Suppose, for example, only 4 percent of the study area are required for the study. In this case, number 1 will be selected randomly and every 25^{th} term will be identified at an interval rate. It is used in the probability sampling because the first case of selecting a sample is with the help of simple random technique and selection of the other samples is determined from the first sample. Normally, it employs the formula N/n, where N is the total number of available samples in the area and n includes the intended sample size for the study. This formula will determine the actual n^{th} term to be studied in the research. In ***cluster sampling*** technique, the area of study is categorized in to certain sub divisions for better ascertaining the process of data collection. This type of sampling is used when the sampling frame is bigger enough to collect data. Here, the sub-headings could be geographical locations, economic demarcations which are slightly more complex than the stratified sampling. In cluster sampling, the area of study is categorized into several clusters and elements are selected randomly from every cluster. In ***multi-stage sampling***, it involves various stages for data collection but only the last phase includes area for study. Unlike stratified or cluster sampling, where elements from different strata or cluster are

studied, wherein, in multi stage sampling, the final stage is considered for data collection. Suppose, for instance, we want to study the functions of universities in the country. For this purpose, we will consider the states where universities are located and we will finally narrow it down to the exact location of the place where universities are actually situated, thereby, considering it for the data collection. Similar to multi-stage sampling, we also have multi-phase sampling, where every phase is studied rigorously before proceeding to the next segment or cluster and thus, every segment are studied thoroughly for the study. Every process of data collection will be assessed and examined for data collection.

- **Non-probability sampling :** These types of techniques are used when the researcher is not sure about the data availability in the field. This sampling procedure is however used when there is no strict sample rule for data collection and it is likely depends on the availability and accessibility of the data in the field. They do not claim for representation of the population as it is not based on probability sampling technique and each and every respondent's view or experience is counted as a matter of data collection. Non probability sampling is used based on the type of research questions that are framed for the study.

Generally, under non probability sampling, there are convenience sampling, purposive sampling, quota sampling, snowball sampling and volunteer sampling. Now, let us begin understanding the techniques available for non probability sampling. In ***convenience sampling***, as the name suggest, it depends on the interests of the researcher and convenience for data collection. It might be the case of geographical implication or resource person that seems convenient for the researcher for data collection. In ***purposive sampling*** technique, the researcher purposefully aims to collect data from the field where the researcher is aware about the kind of data that might be available in the field. For example, if a study is focussing on the recovery of alcohol abusers and if the researcher knows about the treatment facilities available in some places, then the researcher will purposefully visit the places where treatment facilities are provided for the people undergoing recovery from alcohol abuse. Next comes the ***quota***

sampling, where the population is divided in several quotas based on the convenience and interest of the researcher. Unlike the stratified random sampling technique where, the researcher randomly select equal proportion of the sample, rather, it takes into account the choice of the researcher, how he divides the population in to quotas and draws sample from them. ***Snowball sampling*** technique is used when little is known about the availability of the sample in the field. For instance, if a researcher wants to understand domestic violence, then he would definitely be using this technique to ensure effective data collection from the field. Firstly, the researcher would identify a sample in the field with his limited knowledge and then with the help of his existing respondents, the other samples would be identified. This criterion is known as snowball sampling. Lastly ***volunteer sampling*** involves the process when the respondent, himself tries to share his experience to the researcher.

A study incorporates the sampling design based on the research questions. It is solely depended on the nature and objectives of the study. The probability sampling technique is used for generalization of the study. In the earlier chapter, it has been explained that a researcher is always not in a position to cover the entire population of his study, so a sample would provide justification to his research. However, in case of certain studies, where little is known about the availability of the target groups, the researcher opts for non probability sampling procedure for data collection. Generally, in qualitative research, non probability sampling is used to ensure effective participation and data collection from the field. Some studies have also mentioned the use of theoretical sampling in qualitative research, where sampling is closely related to the existing theories and literatures that are available around the study. Theoretical sampling guides the researcher to choose sample for the study. The theories allow the researcher to include samples that would be resourceful and relevant to the study matter. So, whether it is probability or non probability sampling, the research questions and research objectives will determine the type of sampling that is required for fulfilment of the study.

5.4 USE OF SAMPLING TECHNIQUE

Under sampling method information is collected about a part of the population and on the basis of this information conclusions are drawn for the whole population. Application of sampling in social science research is the most careful and conscious method. It is now considered as most effective and essential part of research procedure. There are some reasons of use or application of sampling as mentioned below:-

- If data are collected about only a small sample of the universe, expenditure may be expected to be smaller than if they are collected for the whole universe.
- The data can be collected and summarised more quickly by studying a sample than by studying the entire universe.
- The result of a sample study are frequently more accurate than those of a census study. This is due to the best quality of data collection work done in a sample study.
- When the universe is extremely large, sampling is the only practical method for analysis. Researchers believe that the only practical procedure in this case is to study a sample.



CHECK YOUR PROGRESS

Q1: What is snowball sampling?

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Q2: Define Cluster Sampling.

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5.5 LET US SUM UP

- From this unit, we have learnt about sampling and nature of sampling.
- Sample is a part of the population which is studied in order to make inferences about the whole population.
- Sampling can be broadly classified into two types: Probability Sampling and Non-Probability Sampling.
- In probability sampling, the respondents get equal chance of getting selected, whereas, in non- probability sampling, the respondents do not get equal chance of getting selected as it is based on the choice and interests of the researcher.
- Probability sampling is used across study when there is a definite set of data available in the field and is known to the researcher
- Non-Probability Sampling techniques are used when the researcher is not sure about the data availability in the field
- There are various sub types of probability and non probability sampling
- Sampling technique is efficient in terms of time and cost and hence is of great use in research work.



5.6 FURTHER READING

1) Ahuja, R. (2012). *Research Methods.* Jaipur: Rawat Publications.

2) Das, D.K.L. *(2010). Practice of Social Research.* Jaipur: Rawat Publications.

3) Goode and Hatt (2006): Surjit Publications, Kamala Nagar, Delhi.

4) Kothari, Garg. (2015). *Research Methodology: Methods and Techniques.* New Delhi: New Age International (P) Limited.

5.7 ANSWERS TO CHECK YOUR PROGRESS

Answer to Q No 1: Cluster sampling is that sampling technique in which the area of study is categorized into certain sub divisions for better ascertaining the process of data collection. This type of sampling is used when the sampling frame is bigger enough to collect data.

Answer to QNo 2: Snowball sampling technique that which is used when little is known about the availability of the sample in the field. Here, the researcher firstly would identify a sample in the field with his limited knowledge and then with the help of this sample or respondent, the other samples would be subsequently identified.



5.8 MODEL QUESTIONS

A) Short Questions (Answer each question in about 150 words)

Q1: What is the importance of sampling in research?

Q2: What do you mean by probability sampling? What are its types?

Q3: What is non probability sampling? What are its types?

B) Long Questions (Answer each question in about 300-500 words)

Q1: What is random sample? Describe any one method of drawing a random sample from a population.

Q2: Explain the stratified and multi-stage sample methods with the help of suitable example.

Q3: Discuss the merits of sampling methods of collecting data in sociological research.

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