Objectives

At the end of the theme, you should be able to:

- understand the meaning of what sampling is;
- explain the different functions of population and sampling;
- explain the tenets of the various methods of sampling;
- shed light on the characteristics of a good sample;
- make it clear enough for readers what the size of a sample is;
- have a look at the process of the sample cycle; and
- identify what representative sample is.

II. Content

1. Meaning and Definition of Sampling
2. Functions of Population and Sampling
3. Methods of Sampling

1. Meaning and Definition of Sampling

Sampling is an indispensable technique in social sciences research. A research work cannot be undertaken without the use of sampling. The study of the total population is not possible and it is impracticable. The practical limitation cost, time, and other factors which are usually operative in the situation, stand in the way of studying the total population. The concept of sampling has been introduced with a view to make the research findings economical and accurate (Singh, 2006).

• Coharn W. G. defines the term sampling as:

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'In every branch of science we lack the resources, to study more than a fragment of the phenomena that might advance our knowledge'.

In this definition, a 'Fragment' is the sample as 'phenomena' is the population. The sample observations are applied to the phenomena i.e., generalisation.

• David S. Fox defines the term sampling as:

'In the social sciences, it is not possible to collect data from every respondent relevant to our study but only from some fractional part of the respondents. The process of selecting the fractional part is called sampling' (cited in Singh, 2006).

•Cothari C. R. defines the term sampling as:

‘A sample refers to the technique or the procedure the researcher would adopt in selecting items for the sample. Sample design may as well lay down the number of items to be included in the sample i.e., the size of the sample’ (1980, p.56).

•Kumar R. defines the term sampling as:

‘Sampling is the process of selecting a few (a sample) from a bigger group (the sampling population) to become the basis for estimating or predicting the prevalence of an unknown piece of information, situation, or outcome regarding the bigger group. A sample is a subgroup you are interested in’ (2011).

2. Functions of Population and Sampling

Research work is guided by inductive thinking. The researcher proceeds from specificity togenerality. The sample observation is the specific situation, which is applied to population. It is the general situation.

The sampling is the fundamental to all the statistical techniques and analysis. The measures of a sample are known as statistics and measures of a population. The accuracy of the measures depends on sample representativeness. In research work, generalization is made by estimating measures on the basis of the sample.

3. Methods of Sampling

In social sciences, two methods to sampling are used: (a) Probability Sampling and (b) Non-probability Sampling. In general, with probability sampling, all element (eg., persons, households) in the population have some opportunity of being included in the sample, and the mathematical probability that any one of them will be selected can be calculated. With non-probability sampling, in contrast, population elements are selected on the basis of their availability because they are volunteered, or because of the researcher personal judgment that they are representative. The consequence is that an unknown portion of the population is excluded (eg., Those who did not volunteer). One of the most common types of non-probability sample is called a ‘convenience sample’ not because such samples are necessarily easy to recruit, but because the researcher whatever individuals are available rather than selecting from the entire population because some members of the population have no chance of being sampled, the extent to which a convenience sample-regardless of its size- actually represents the entire population cannot be known. Specifically, these two methods (types) can be categorised as follows:

(a) Probability (random) Samples

- Simple random sample
- Systematic random sample
- Stratified random sample
- Multistage sample
- Cluster sample.

(b) Non-probability samples

- Convenience sample
- Purposive sample
- Quota sample

In more explicit terms, these methods are identified and characterised in the following points:

(a) Probability Sampling

A probability sampling scheme is one in which every unit in the population has a chance (greater than zero) of being selected in the sample, and this probability can be accurately determined.

Probability sampling includes:

• ***Simple random sampling***

- Applicable when population is small, homogeneous, and really available.
- All subsets of the frame are given an equal probability of selection.
- It provides for greatest number of possible samples. This is done by assigning a number to each unit in the sampling frame.
- A table of random number of lottery system is used to determine which units are to be selected.
- Estimates are easy to calculate.

• ***Systematic random sampling***

- It relies on arranging the target population according to some ordering scheme and then selecting elements at regular intervals theory that ordered list.
- It involves a random start and then proceeds with the selection of every KTH element from then onwards. In this case, K= (population size/ sample size).
- It is important in that the starting point is not automatically the first in the list, but is instead randomly chosen from within the first to the KTH element in the list.

• ***Stratified random sampling***

- It is where the population embraces a number of distinct categories. The frame can be organised into separate 'strata'. Each stratum is then samples as an independent sub-population, out of which individual elements can be randomly selected.
- Every unit in a stratum has the same chance of being selected.
- Using the same sampling fraction for all strata ensures proportionate representation in the sample.
- Adequate representation of minority subgroups of interest can be ensured by stratification and varying sampling fraction between strata as required.

• ***Cluster sampling***

- It is an example of 'two-stage sampling'
- First stage a sample of areas is chosen;
- Second stage a sample of respondents within those areas is selected.
- Population divided into clusters of homogeneous units, usually based on geographical contiguity
- Sampling units are groups rather than individuals.
- A sample of such clusters is then selected.
- All units from the selected clusters are studied.
- Its advantage is that it cuts down the cost of preparing a sampling frame. This can reduce travel and other administrative costs.

• *Multistage sampling*

- It is a complex form of cluster sampling in which two or more levels of units are embedded one in the other.
- It is an effective strategy because it banks on multiple randomisations; as such, extremely used.
- It is used when a complete list of all members of the population does not exist and is inappropriate.

(b) Non-probability Sampling

It is also known as non-parametric sampling which is used for certain purposes. Non-probability sampling includes:

• ***Convenience sampling***

- Sometimes known as grab or opportunity sampling or accidental or haphazard sampling.
- It involves the sample being drawn from that part of the population which is close to hand. That is, it is readily available and convenient.
- The researcher using such a sample cannot scientifically make generalisations about the total population from this sample because it would not be representative enough.
- This type of sampling is not useful for pilot testing.

• ***Purposive sampling***

- It is used by some arbitrary method because it is known to be representative of the total population; or it is well known that it will produce well matched groups.
- Its main idea is to pick out the sample in relation to some criteria, which are considered important for particular studies.
- This technique is appropriate when the study places special emphasis upon the control of specific variables.

• ***Quota sampling***

- It is based on first the segmentation of the population into mutually exclusive sub-groups just as in stratified sampling.
- Then judgment is used to select sub- subjects or units from each segment based on a specified proportion.
- It is this second step that makes the technique one of the non-probability sampling.
- It is an easy sampling technique; but, its disadvantage is that it is not a representative sample.

4. Characteristics of a Good Sample

The following are the main characteristics of a good sample:

1. A good sample is the true representative of the population corresponding to its properties.
2. A good sample is free from bias.
3. A good sample is an objective one.
4. A good sample is comprehensive in nature.
5. A good sample maintains accuracy.
6. A good sample is economical from energy, time and money.
7. The subjects of a good sample are easily approachable.
8. The size of a good sample is such that it yields accurate results.
9. A good sample makes the research work more feasible.
10. A good sample has the practicability for research situation (Singh, 2006).

5. Size of a Sample

The size of the sample often depends on the researcher's precision to estimate the

population parameter at a particular level. However, it is clear that there is no clear rule to determine the size of the sample.

The best answer to the question of size is to use a large sample. A larger sample is lively to be much more representative of the population. Furthermore, with a large sample, the data can be more accurate and precise. It was pointed out that in that the larger the sample, the smaller the standard error (ibid).

6. The Sampling Cycle

Five stages of the cycle are proposed:

Stage 1: Identifying the universe population.

Stage 2: Applying techniques for the sample.

Stage 3: Accepting the sample.

Stage 4: Data producing sample.

Stage 5: Findings and generalization