

SIAP

Statistical Institute for Asia and the Pacific

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MULTISTAGE SAMPLING DESIGNS

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Core Data Items for Agricultural and Rural Statistics

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LEARNING OBJECTIVES

The learning objectives of this session are to

- Understand the rationale behind multistage sampling designs;
- Demonstrate the application of multistage sampling designs;
- Explore the limits of multistage designs.

OVERVIEW OF THE PRESENTATION

- Basics of multistage sampling
- Sample Units
- Advantages and disadvantages of multistage sampling

Sub-sampling – Multi-stage sampling

MULTI-STAGE CLUSTER SAMPLING

- In a *single-stage cluster sampling*, a sample of cluster is selected and all the population units of each selected clusters are surveyed.
- When clusters to large to cover all their population units in the survey, a sample of population units from each selected cluster is surveyed.
- Such a design is called 'Multi-stage cluster' or simply 'multi-stage' sampling.

MULTI-STAGE SAMPLING

- As the name suggests, Multi-stage sampling involves multiple stages of sampling.
- The number of stages can be numerous, although it is rare to have more than 3 stages.
- For the present course, we will concentrate only on two-stage sampling.
- The process of selecting a sample of population units from selected clusters is known as *Sub-sampling*.

STAGE-WISE SELECTION

- Stage sampling is an extension of cluster sampling. For a two-stage sampling,
- we select the clusters at the first stage
 - selected clusters are called *first stage units* (FSUs) or *primary stage units* (PSUs);
- then select a sample of units from within each selected cluster – selected units are called second stage units (SSUs).

Multi-stage (Cluster) Sampling

SAMPLING UNITS AT DIFFERENT STAGES

Examples of two-stage sampling

Stage 1

villages

Dwellings

Hospitals

Businesses

Coconut trees

Stage 2

households

People

Patients

Employees

Coconuts

Multi-stage (Cluster) Sampling

ADVANTAGES OF MULTISTAGE SAMPLING

Sampling frames normally available at higher stages, may be prepared at lower stages

Cost considerations

Flexibility in choice of sampling units and methods of selection at different stages

Contributions of different stages towards sampling variance may be estimated separately

SAMPLING AT TWO STAGES

In practice, many multi-stage designs involve complex sub-sampling of and within PSUs.

The selection at the two stages are done independently and may employ different sampling schemes like:

- SRSWOR
- Systematic
- Probability Proportional to Size (PPS)

THANK YOU