

Sampling Methods for Sample-Based Surveys

What is the purpose of sampling?

There are two possible ways to monitor and evaluate the outcomes and impact that project interventions have on project beneficiaries: (i) monitor the changes taking place within the entire population of project beneficiaries and undertake regular census-based surveys or through participatory M&E. This is the ideal situation, but it has high cost implications. (ii) monitor and survey only a subset of project beneficiaries through sample-based surveys. These types of surveys are less costly in terms of time and financial resources and are therefore much more practical, although they require skills in sample design.

Sampling is the use of a subset of a population to represent the whole population. When proper sampling methods are used, sample-based surveys are useful to derive reliable information on project outcomes and impact, and findings from a sample of beneficiaries [(C) in Figure 1] can be inferred to the overall population of project beneficiaries (B).

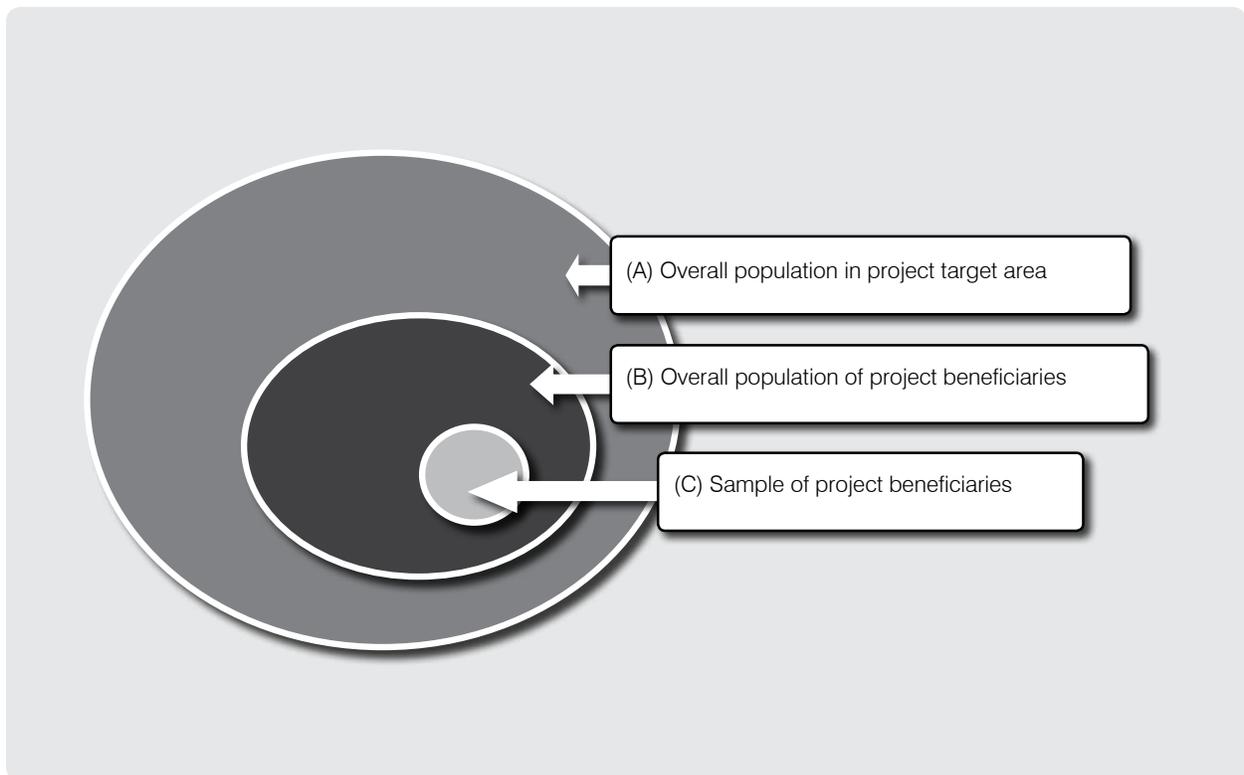


Figure 1. Beneficiary population vs. overall population in project target area

In most IFAD-funded projects, specific project interventions are targeted to specific target groups (e.g., training extended to farmers). Therefore, the total number of project beneficiaries [(B) in Figure 1] is usually smaller than the total number of persons living in the project target area [(A) in Figure 1]. In rare cases, project interventions may benefit the entire population in a given village (e.g., in the case of a local road newly constructed that will benefit the entire populations of villages situated near this road).

Choosing the appropriate sampling method

The first step, when undertaking a survey, is to identify the best sampling method. Among the various sampling methods that exist, the following two methods are recommended for IFAD-funded projects:

RANDOM SAMPLING (also called probability sampling): with the use of these methods, each member of a target population has an equal probability of selection. This avoids bias in the selection of survey respondents. Findings from a random sample can be used to represent the overall population with a known margin of error. The types of random sampling methods recommended for IFAD projects include the following:

Simple random sampling: Used when the overall population has no distinct characteristic and is homogeneous and when the overall population is not too widely dispersed. The random selected sample of beneficiaries will be representative of the overall beneficiary population.

Stratified sampling: Used to increase survey precision and reduce the margin of error when the overall population of project beneficiaries includes specific subgroups¹ or strata² with very distinct, mutually exclusive socioeconomic characteristics. Stratified sampling involves the process of dividing members of the population into homogeneous subgroups before sampling. Once subgroups/strata are identified, random sampling is applied within each subgroup.

Cluster sampling: Used to reduce survey costs when the overall beneficiary population can be easily divided, like in stratified sampling, into “natural” sub-groups³, with those groups becoming the primary sampling unit (as opposed to individuals being the primary sampling unit as in stratified sampling of random sampling). A random sampling technique is then used to choose which clusters to include in the study of randomly selecting the clusters which will be surveyed, then randomly selecting the individuals within these selected clusters.

One version of cluster sampling is **area sampling** or **geographical cluster sampling**, where clusters consist of geographical areas. This method is recommended for geographically dispersed populations that are too expensive to survey. This type of a survey helps concentrate survey efforts to a reduced number of geographic areas because all members of selected groups will be surveyed.

¹ For example: (a) 40% of project beneficiaries are livestock owners who own 10 cattle or more and 60% are landless households with no cattle; or (b) 70% of the project beneficiaries live in lowland, irrigated areas and 30% live in highland, dry areas.

² For example: (a) 30% of project beneficiaries are classified as ultra-poor, 50% poor and 20% better off; or (b) targeted beneficiaries are 80% women borrowers and 20% male borrowers.

³ For example: Groups of individual beneficiaries organized in Farmers' Groups or Women Groups.

Stratified, cluster sampling: Cluster sampling may be combined with stratified sampling when the beneficiary population includes subgroups/strata with distinct socioeconomic characteristics of individuals who can also be organised in clusters. This method combines both benefits of stratified sampling and cluster sampling, thus increasing precision while reducing costs (by increasing sampling efficiency.)

NON-RANDOM SAMPLING (also called non-probability sampling): With these methods, only some members of the beneficiary population have a chance of selection, while others will be excluded *a priori* from participation in the survey. Such methods are usually used to save time, but they do not allow the estimation of sampling errors. This means that information gathered through non-random samples cannot be extrapolated to the overall population of beneficiaries or that any generalisations obtained from a non-random sample must be filtered through one's knowledge of the topic being studied. The types of non-random sampling methods recommended for IFAD projects include the following:

Convenience sampling (also called accidental sampling): This involves drawing the sample from a population that is easy to reach or close at hand. This method is often used during IFAD supervision missions, with mission members collecting information from beneficiaries who are easy to reach (e.g., they live near the road or in the villages visited by the mission).

Purposive sampling (also called judgmental sampling): Purposive sampling involves choosing the sample based on the best judgment on who would be appropriate for the study. Examples include key informant interviews, where a limited number of respondents is chosen from people who are assumed to have expertise in area being studied.

Determining the appropriate sample size

The sample size for a survey depends on the desired level of precision for survey findings, precision being defined by the confidence interval (or margin of error) that one is willing to tolerate in the survey, given the chosen confidence level (most researchers using a 95% confidence level).

→ *For example: Using a 95% confidence level, if it is found that 55% of the sample of interviewed project beneficiaries are satisfied with project interventions and if the margin of error (or confidence interval) is $\pm 5\%$, it means that we can be 95% confident that between 50% and 60% of the overall beneficiary population is satisfied with project interventions.*

The larger the sample, the more precise the findings will be. However, surveying large samples will be more costly and time-consuming to organise.

Within IFAD-funded projects and for projects that do not feel confident about getting the most appropriate sample size, the two following standard sampling methods and sample sizes are recommended:

RIMS impact surveys: The recommended method is geographic cluster sampling, with a standard sample size of 900 households (30 randomly selected area-based clusters, with 30 randomly selected households per cluster).

RIMS+ surveys: Same as above, as the RIMS+ survey is to be conducted at the same time that the standard RIMS survey is done (*here, the same household will be asked two sets of questions: questions from the standard RIMS questionnaire and questions from the project-specific RIMS+ questionnaire*).

Annual outcome surveys: The recommended sample size is 200 households, so that the survey is less costly and time-consuming to conduct. Each project shall choose the more appropriate random sampling method for the selection of these 200 households. In addition, non-random sampling methods can be used for the selection of participants in focus group discussions and key informant interviews.

For projects confident of calculating their own sample size (for example if it is assumed that a 900 household sample size is too large), the Internet has many websites that will help calculate the ideal sample size (e.g., <http://www.surveysystem.com/sscalc.htm>).

While the manual IFAD RIMS Practical Guidance for Impact Surveys- Part I, available on IFAD Website (<http://www.ifad.org/operations/rims/index.htm>) offers a step-by-step approach for producing RIMS and RIMS+ samples, Technical Guidance 2 provides a step-by-step approach for producing annual outcome survey samples.

Source

Technical Guidelines # 5, Monitoring and Evaluation, Knowledge Management, A Tool Kit for Project Staff, Asia Pacific Division, IFAD, Rome.