

# Qualitative and Quantitative Methods in Monitoring and Evaluation



**T**he wide variety of methods available for conducting project and programme monitoring and evaluation (M&E) can be overwhelming. Each method has its advantages; limitations; skill, knowledge, time and cost requirements and a range of reporting possibilities. In carrying out M&E activities, programme officers may use established research methods from the biophysical and social sciences, including a growing collection of participatory methods. These methods fall into two broad categories: qualitative and quantitative. Understanding the differences and overlaps of qualitative and quantitative methods and their corresponding data collection and analysis can help inform M&E data collection choices at various points in a project's life cycle.

# Quantitative and qualitative methods— an overview

Quantitative methods directly measure the status or change of a specific variable, for example, changes in crop yield, kilometres of road built or number of hours women spend fetching water. Quantitative methods provide direct numerical results. Quantitative methods can be also classified as “formal” methods in that they use a structured questionnaire or other form of data collection.

Qualitative methods gather information by asking people to explain what they observe, do, believe or feel. The output from qualitative methods is textual descriptions. Qualitative methods can also be called “informal” in that they do not use a structured questionnaire and have an open-ended approach to gathering data.

Each method has advantages and disadvantages.

Choosing to use a method to produce or analyse qualitative or quantitative data depends not only on the type of information needed but also on the capacities and resources available, how the information will be used and how precise the data need to be. Yet, the differences between qualitative and quantitative approaches are not absolute. For example, much qualitative information can be quantified—opinions can be clustered into groups and then counted, thereby becoming quantitative. Rather than relying on one method exclusively, more M&E practitioners are finding that a *combination* of methods increases their ability to better understand and interpret complex situations.

**Quantitative methods** produce data that are easily represented as numbers, answering questions such as “**How much...?**”, “**How many...?**”, and “**How frequent ...?**”.

Quantitative data generally require formal measurements of variables such as income, production or population densities.

**Qualitative methods** produce data that are not easily summarised in numerical form, broadly answering the “**how**” and “**why**” through, for instance, meetings, interviews or general observations. Qualitative data are more appropriate for understanding people’s attitudes or behaviours, beliefs, opinions, experiences and priorities. Qualitative data include answers to questions like “Why do you think this happened?” and “How do you think this will affect you?”.

| Quantitative methods   | Qualitative methods  |
|--|--|
| <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Provide robust, quantified findings</li> <li>• Information easier to analyse</li> </ul>  | <p><b>Advantages</b></p> <ul style="list-style-type: none"> <li>• Useful to gain insights on what is happening</li> <li>• Easy to organise and cost-effective (small samples)</li> </ul> |
| <p><b>Limitations</b></p> <ul style="list-style-type: none"> <li>• Costly to organise (large samples)</li> <li>• Do not provide contextual information</li> <li>• Offer limited insights on what is happening</li> </ul> | <p><b>Limitations</b></p> <ul style="list-style-type: none"> <li>• Information collected cannot be generalised</li> <li>• Information harder to analyse</li> </ul>                       |

Regardless of what method is used, they will produce high-quality results if they are:

- Based on valid/credible data/ information (the information comes from the correct source)
- Representative, they can be generalised (a representative sample)
- Reliable and dependable (can be done again in future)
- Objective, confirmable (they must have been clearly documented)

## Combining qualitative and quantitative methods

There are many advantages in combining methods while carrying out M&E. In some cases, methods are combined because the data are best gathered in a variety of ways—no single methodology would produce all the data needed (see example below).

### ***Diverse methods for sustainability monitoring in the Karnataka Rural Water Supply and Sanitation Project, India***

A village-based, sustainability-monitoring process was developed to understand what issues could potentially adversely affect the sustainability of water and sanitation services in India. A set of nine questionnaires was developed to be used in visits to 15 villages, with the following topics: village socioeconomic profile; technical: water supply (asset condition and profile); technical: sanitation (drainage, soak-pits and dustbins); technical: sanitation (household latrines); financial: costs, tariff, billing and collection; institutional: village water and sanitation committee (VWSC) – composition, functions and effectiveness; household: facts, perception of demand met; social: participation by women and poor; and tap stand monitoring.

#### **Preparation and data collection**

Before starting the data collection, a 1-day preparatory workshop was held for the teams to brainstorm about the concept and the methods. A variety of methods were used in order to answer the questionnaires: direct observations, general meetings, focus group discussions, household surveys, and observations and interviews of villagers while collecting water at the public tap stands.

#### **Collation and analysis**

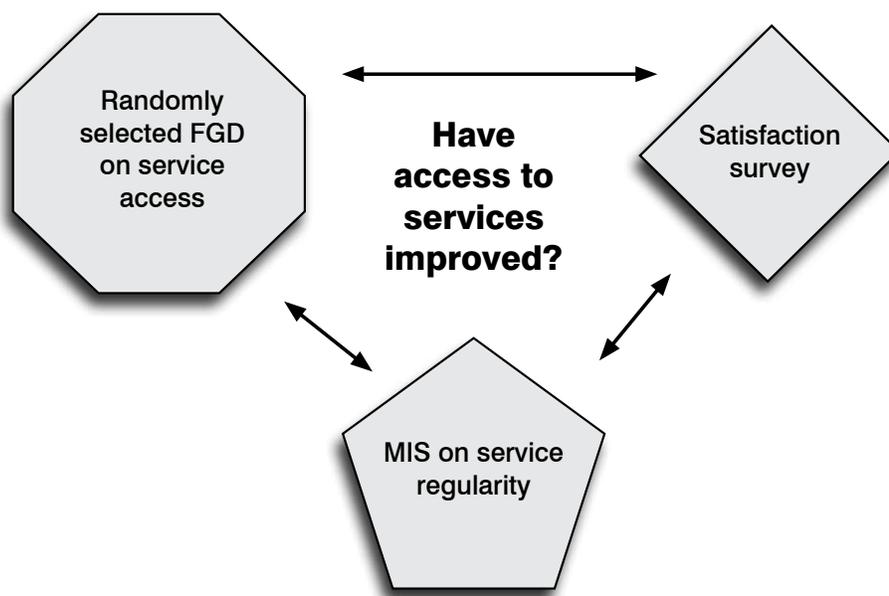
After the fieldwork, all the data collected through the questionnaires and scores of the 71 indicators were converted into a sustainability index for each village. The analysis revealed that nine out of the 15 villages visited fell into the “likely to be sustainable” category (60% with a score above 0.65), five into the “uncertain” category (33% between 0.50 and 0.64) and one in the “unlikely” category (below 0.50).

In other cases, methods are combined to confirm or help interpret results. For example, a participatory rural appraisal (PRA) process used to find out how primary stakeholders are benefiting from a project might combine some 15 or more different methods ranging from transect walks to matrix ranking and focus group discussions. Likewise, a household survey or annual project review meeting would combine a series of interview, discussion and facilitation methods.

It is now strongly recommended that M&E be conducted with a mix of methods so that information can be “triangulated” in order to double or triple check results (see Figure 1).

Furthermore, it is possible to combine methods within one data collection tool. For example, quantitative surveys can also collect qualitative information, such as the opinion of the respondent about useful project services. In fact, the current guidelines for annual outcome surveys largely collect qualitative information such as opinion on the direction and size of changes. Questionnaires can also include open-ended questions, such as “What is your main problem in farming?”.

**Figure 1. Example of triangulation of a mix of quantitative and qualitative M&E methods.**



Similarly, qualitative methods can gather some quantitative data. This can be a useful approach where the individual respondents in a formal survey would find it difficult to provide accurate data. For example, data on crop inputs, outputs, prices, costs and returns may be best obtained in a focus group discussion with a group of farmers who can come to agreement between themselves on typical numbers for these indicators.

## Combining M&E methods along the results chain

IFAD’s results-based management framework and the logical framework approach that mirrors it provide a context within which to consider the fit of various M&E tools and methods along the results chain.

Table 1 shows what methods are recommended to monitor each level of the results chain, taking into account that certain methods will be more expensive, time-consuming and technically complex than others. Descriptions of the most common methods recommended for use in IFAD projects follow the table.

**Table 1. Tools that can be used in the results chain.**

| <b>Results chain</b>   | <b>Quantitative data used</b>  | <b>Qualitative data used</b>  |
|--|--|---|
| <p><b>Activity and output</b><br/>Tools are used to measure effectiveness of project strategies and are collected every month or at the end of each quarter.</p> | <ul style="list-style-type: none"> <li>• Activity and output tracking tools like data collection forms and matrices</li> <li>• Diaries and farm record books and self-help group records</li> <li>• Micro-finance records</li> <li>• Staff records</li> <li>• Annual work plan and budget</li> </ul> | <ul style="list-style-type: none"> <li>• Brainstorming</li> <li>• Key informant interviews</li> <li>• Focus group discussions</li> <li>• Diagramming</li> </ul>                                   |
| <p><b>Outcome</b><br/>(collected annually)</p>   | <ul style="list-style-type: none"> <li>• Questionnaire survey (annual outcome survey / thematic outcome survey)</li> <li>• KAP surveys of training outcomes</li> <li>• GIS annual surveys</li> </ul>   | <ul style="list-style-type: none"> <li>• Focus group discussions</li> <li>• Key informant interviews</li> <li>• Case studies</li> <li>• “H” diagramming and input-output diagramming</li> </ul>   |
| <p><b>Impact</b><br/>(data collected three times during the life cycle of the project)</p>   | <ul style="list-style-type: none"> <li>• Questionnaire surveys for baseline, mid-term and final evaluation (RIMS and RIMS+)</li> <li>• Statistics on production, etc.</li> </ul>   | <ul style="list-style-type: none"> <li>• Diagramming</li> <li>• Focus group discussions</li> <li>• Key informant interviews</li> <li>• Most significant change</li> <li>• Case studies</li> </ul> |

The table above divides the data collection tools between those used to measure outcomes and those used to measure impact, but, in practice, there can be considerable overlap. Although mid-term and end-of-project surveys aim to gather evidence of project impact, it is useful to gather information on project outputs and outcomes so that it is possible to link impacts to outputs and outcomes via a results chain, which helps attribute project activities to results. Annual outcome surveys can also collect impact level data, such as changes in food security and assets. This gives project management an indication of initial impacts and can be useful to complement data from mid-term and end-of project (completion) impact surveys. There is always a risk that data from one of the surveys carried out at baseline, mid-term and completion will be distorted by unusual climatic, disease or economic events, and so it does not provide a good basis for comparison with other surveys. Collecting data annually can mitigate this risk. In fact, a good system of data collection in annual outcome surveys can reduce the need for so much data to be collected in impact surveys—although these may still be needed for indicators such as child anthropometrics and also for indicators where little change is expected from year to year—such as the quality of housing, water and sanitation.

## Mixing methods in practice

### Thematic outcome surveys

A study on the impact of training for the Marketing and Enterprise Promotion Programme in Bhutan used the following methods for gathering information:

- A formal questionnaire survey of a random 470 rural households who had received training
- A formal questionnaire survey of a sample of 47 extension staff involved in providing training
- Focus group discussions (30) with a total of 337 rural households
- Focus group discussions (25) with a total of 50 extension staff

The final report has tables analysing data from the formal survey, including qualitative information such as farmers' assessment of the quality of training. The focus group discussions were used to provide more detailed explanation of the formal survey data, such as why it was difficult to persuade people to go on residential training courses, and provide specific examples of technology adoption and factors preventing adoption. In addition, the report included seven case studies of individual farmers and groups describing how training has helped to develop their enterprises and livelihoods.

### Planned impact evaluation surveys

The new IFAD-supported Integrated Livelihood Support Project in India proposes to contract an agency to carry out baseline, mid-term and final impact studies. Their approach combines both qualitative and quantitative (formal and informal) methods. The following terms of reference developed for this project could be easily adopted by other projects:

1. An initial informal reconnaissance of the project area to understand the project approach and implementation practices and to identify appropriate indicators and sampling methods for a formal survey. The study team would meet project staff and participants, as well as other local people (the potential control group). Key evaluation questions would be posed to find out what happened, to whom and how. At the end of this process, a brief inception report for project management would be prepared.
2. A formal questionnaire survey would then gather quantitative data (and maybe also some qualitative opinions). Initial analysis of results would be carried out before the next step.
3. This survey would be followed up by further informal investigations, such as focus group discussions, to find out why and how the changes observed in the formal survey took place (or why expected changes did not take place). In addition, some case studies of project households and groups would be carried out.
4. The final report would combine information from all these sources.



2. *Annual outcome survey* – is a simple survey conducted with a small sample of about 400 randomly selected households split between project and control groups. The surveys are undertaken annually in order to regularly measure the positive/negative changes taking place at the household level. They provide information that project management teams can use to take timely, corrective action during the course of project implementation.
3. *Thematic outcome survey* – is a variation on the annual outcome survey. It focuses on a single component or theme, and surveys may cover different themes in different years.

## **Geographic information system**

Satellite imagery is used for the collection of information and computers are used for interpretation. Data are gathered on spatial changes, soil erosion and rehabilitation mapping, and for mapping change in cropping patterns over time. These are usually collected at baseline prior to project intervention and later after project completion.

## **Most common qualitative methods used in IFAD projects**

These methods are useful to provide explanations of trends, reasons for success or failure, external events affecting project implementation as well as insights on beneficiaries' perceptions, feelings, opinions, and concerns. They are most useful when used in conjunction with quantitative surveys as they can help better interpret survey findings.

### **Key informant interview**

A key informant interview is conducted with a person who can provide detailed information and opinion on a particular subject based on his or her knowledge of a particular issue. For example, this could be information on how project activities have influenced the use of water resources in the community when the key informant is a member of a water users' association. A key informant can be young or old and from any socioeconomic or ethnic group. Key informant interviews are open-ended, semi-structured interviews. Every interview should have clear objectives about what kind of information is needed and how the information will be used.

### **Focus group discussion**

A focus group discussion is facilitated discussion among 8-12 carefully selected participants. The idea is that group members discuss the topic among themselves with guidance from a facilitator. It is a method used to obtain in-depth qualitative information on perceptions and ideas from a group of people who have something in common. For example, they have a shared interest in the topic or are from similar backgrounds. Homogeneous groups are preferred because mixed age or gender groups may inhibit some people (especially women or youth) from expressing their views in front of others. Focus group discussions are structured around a set of pre-determined questions—usually no more than 10 but the discussion should be free-flowing. Ideally, participants' comments will stimulate and influence the thinking and sharing of others. If facilitated well, focus

group discussions can bring out rich and detailed information. They generally stimulate rich responses and provide a valuable opportunity to gain insights into behaviour, attitudes and feelings. It takes more than one focus group discussion on any one topic to produce valid results, usually three or four. You will know you have conducted enough discussions (with the same set of questions) when you are not hearing anything new anymore. That is, you have reached a point of saturation. Focus group discussions generate qualitative information and the outputs will be a textual description of a situation. As such, findings will not be representative of the views of the entire population. This is why focus group discussions are best used to complement the findings of RIM surveys or annual outcome surveys, for example, to understand better a specific finding emerging from these surveys.

### **Case studies in practice**

- **Studies commissioned for the impact evaluation of roads and small enterprises in the Agriculture, Marketing and Enterprise Promotion Programme in Bhutan included case studies as well as quantitative surveys.**
- **An evaluation of micro-enterprises supported by Proshika, an NGO in Bangladesh, used case studies as the main means of data collection.**

## **Case studies**

In-depth interviews, usually with an individual household (but it could also be a group or an enterprise) in order to write a brief story about their experience with the project. They usually adopt a historical perspective to show the situation that the household was in before they joined the project, followed by a description of various project interventions and their outcomes, which may have been spread over some years. Improvements to living standards are described along with the opinions of household members about the project and their plans for the future. Case studies can also be a good way of collecting information on small and medium enterprises (SME). Questionnaire surveys tend to be not so good at collecting information from SME since these businesses vary too greatly (in terms of sector, activity, scale, financing, etc.) for a standard questionnaire to be used.

Case studies (illustrated with photographs) are often included as boxes in project reports, where they add a human dimension to an otherwise dry description and data. As such, case studies tend to be success stories, but they can also be valuable as a means of finding out why things did not go as expected. For example, a thematic study of enterprise development could ask each project implementing unit (such as a district office or NGO) to produce two case studies of success stories, two of failures and two that are between success and failure.

## **Other methods**

- The KAP (knowledge, attitude and practice) survey is a simple survey with a small sample (about 40 to 50) of people who have attended a specific training course or other capacity-building event. It aims to find out if the training was successful and if it resulted in a change in practice (such as adoption of a new technology).
- Biophysical surveys, trend lines and time-series data are other tools that can be used to collect data on natural resource management, agriculture, nutrition and health. Statistics on crop production may be

## Mixing methods in practice

### Monitoring project results

The recently completed IFAD grant project Scaling up Micro-Irrigation Systems (SCAMPIS) was implemented in two districts of Orissa in India by the NGO IDE-India. Project field staff reported on total numbers of farmers reached and numbers adopting three different types of micro-irrigation system (MIS) used to grow vegetables. An annual survey was used to collect data on vegetable production, consumption and sales from a random sample of 240 farmers in 47 villages (80 farmers for each of the three technologies). This was supplemented by the Most Significant Change methodology where a small number of farmers were asked about what they thought was the most significant change brought about by the project and what difficulties they faced.

### Impact evaluation

The Char Development and Settlement Project (CDSP) on the coast of southern Bangladesh has been funded by the Netherlands government since the start of Phase I in 1994. IFAD has now joined with the Netherlands government to co-finance Phase IV. Prior to the start of phase IV, IFAD and its Netherlands partner did an evaluation of Phases I, II and III to find out what benefits might be expected from Phase IV, and to see if the improvements of Phases I and II, completed in prior years, had been sustained. The following sources of information were used in this evaluation:

- Qualitative participatory rural appraisal survey on impact of the project, with 10 focus group discussions in each of the three project areas.
- Quantitative sample survey covering a random sample of 900 households.
- Qualitative study of gender interventions and impact using focus group discussions and case studies.
- Secondary data: earlier reports on project outputs and outcomes, including case studies.

CDSP is a land reclamation project, and the quantitative sample survey provided data on farmers' opinions on how flooding, drainage and salinity on their land had changed between 2004 and 2010. The participatory rural appraisal survey was able to provide more detailed timelines regarding trends in land quality over a longer period. Secondary project data provided time-series data on soil salinity measurements. The sample survey provided data on livestock ownership, income, assets, housing, water and sanitation, and access to micro-finance. The participatory rural appraisal activity generated matrices showing changes in farming practices and livelihoods in each of the project areas, as well as changes in wealth ranking. The gender study contributed a specific women's perspective on the changes resulting from the project, highlighting issues such as access to health services.

useful—both as evidence of trends that may partly result from project contributions and as a basis of comparison with survey data from project participants.

- “Most Significant Change” stories capture data that cannot be easily quantified. The method uses narratives and stories from participants to understand changes brought about by the project at the household level. It is also used to capture institutional changes as a result of project intervention—as the title suggests: the most significant change. Both positive and negative changes are distilled from human stories to complement quantitative impact analysis.
- Other qualitative methods that can be used for M&E include brainstorming, diagramming, and mapping.

## Additional resources

A number of IFAD resources elaborate extensively on various methods for different M&E needs and how to conduct them.

One very good overview of methods is found in Annex D of IFAD’s publication, *A Guide for Project M&E*. This Annex summarises 34 methods that are useful for specific M&E tasks. Each method is briefly explained in terms of purpose, steps and application tips. Available at: <http://www.ifad.org/evaluation/guide/annexd/index.htm>.

IFAD ASIA’s resource section hosts a number of videos and presentations on a variety of themes, including M&E. Here you can also find links to download the full text of IFAD’s Monitoring and Evaluation Knowledge Management Tool Box. This publication includes workshop material and specific technical guidelines for RIMS+ surveys, annual outcome surveys, focus group discussions, key informant interviews, and sampling methods for sample-based surveys. It is available online under M&E Toolkit Collection within the Resource Library of <http://asia.ifad.org>.

## References

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Significant contributions were also provided by Edward Mallorie.

## Source

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