Chapter 2　Planning Project Evaluation

This chapter explains key issues to consider for evaluation planning. “Evaluation questions” will be explained as the first step in making a work plan, and then, “basis for judgment,” “necessary data and data sources,” and “data collection methods” will follow.

Tips!

- First, determine what we need to learn in the evaluation (*evaluation questions*). The Five Evaluation Criteria will help us formulate evaluation questions as specifically as possible.

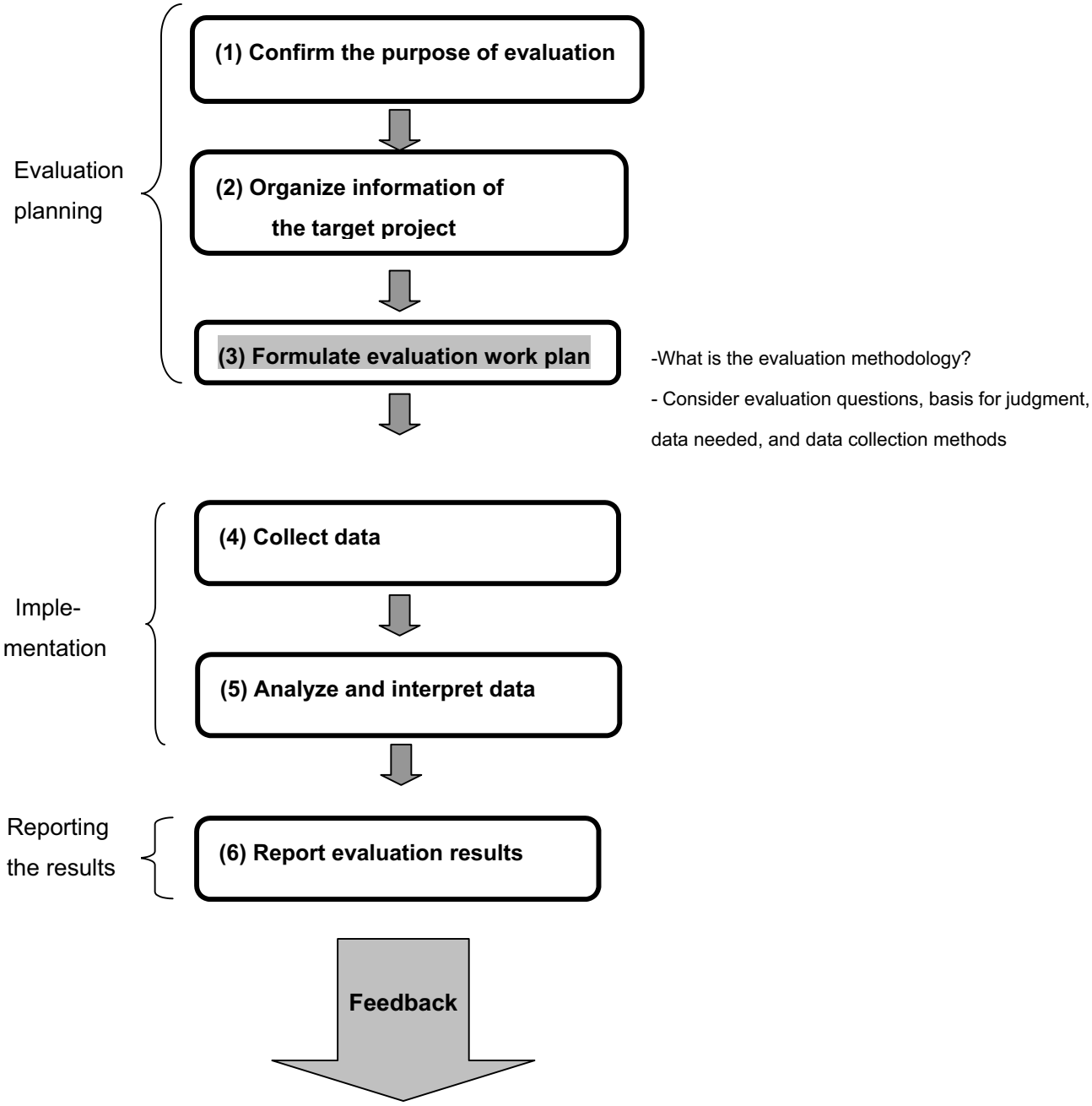
- Next, consider with what we ought to compare the project or program in order to make value judgment (*basis for judgment*).

- Then, consider whom to contact, what data to collect, and how to do it in order to answer evaluation questions (*data source*, *necessary data, and data collection methods*).

- There are various data collection and analysis methods. It is more effective to use several different approaches in order to offset the weakness of one approach by the strength of another.

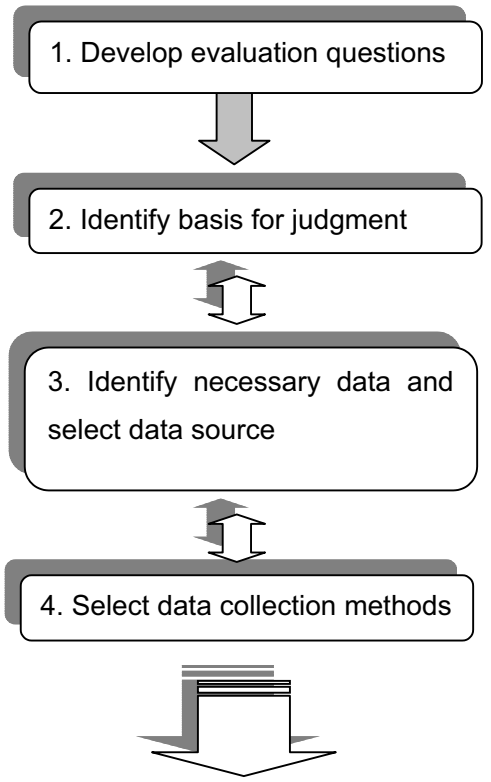
- Finally, bring all planning elements together in an Evaluation Grid, a tool to develop evaluation work plans. The Evaluation Grid should be flexibly applied to meet the different purposes of each evaluation study.

Steps of Evaluation Study



Making an evaluation plan is a process for determining what and how to implement the evaluation in line with its purpose. An evaluation study is usually limited in its budget and time, and therefore an effective and efficient way to conduct the study should be well developed. The major steps of evaluation planning are described below. These steps are interrelated with each other, and thus are in many cases developed at the same time.

"Steps of making an evaluation plan"



What to know through evaluation

On what basis the value judgment to be made

What data to be collected from where

How to collect data

Evaluation Grid

Evaluation Criteria	Evaluation Questions		Basis for judgement	Data Needed	Data Sources	Data Collection Methods
	Main questions	Sub-questions				
Relevance						
Effectiveness						
Efficiency						
Impact						
Sustainability						
Others						

1. Developing Evaluation Questions

(1) Levels of Evaluation Questions and Five Evaluation Criteria

i) What is an 'Evaluation Question'?

Evaluation questions represent "what one wants to know through evaluation." For instance, the question of "whether a project was (or will be) meaningful" is an example of an evaluation question and a common question for project evaluation. More focused questions to verify the value of a project will be: "Were effects produced by the project?" or "Were resources efficiently used?" It is possible to formulate more specific questions focusing on the effectiveness of a project. In an irrigation project, for instance, evaluators can ask such questions as: "Was the production volume of crops increased?" or "Were farmers' incomes increased?" Starting from a general question, more specific questions should be developed to make evaluation study operational. By doing so, more concrete survey methods as well as the necessary data are easily identified.

Project operation departments within JICA develop evaluation questions that consider the actual situation of a project and what should be focused upon in the evaluation's limited timeframe in order to obtain useful findings. JICA staff is responsible for setting appropriate evaluation questions because they are in the position to understand the main issues of the target project as well as the related sector issues. They should keep in mind those issues when developing the evaluation questions so that the evaluation results will be fully utilized for future project improvement.

ii) Connection between Evaluation Questions and Five Evaluation Criteria

As explained in the previous section, JICA adopts the DAC's Five Evaluation Criteria (namely relevance, effectiveness, efficiency, impact, and sustainability) to make a value judgment about the project results. Evaluation questions can be developed according to the five criteria. For example, in the case of a terminal evaluation of the "Mathematics and Science Teachers Training Project," evaluation questions for determining the effectiveness of the project could be: "Was there any improvement in teachers' teaching methods as a result of the project?" or "Is there any change in teachers' attitudes?" More specific questions could be: "How do students evaluate the changes in teachers' attitudes?" and "Has the level of achievement of teachers met with target values (only if the rating system for evaluating teaching methods has been introduced in the project as a monitoring system)?" The more specific the questions, the easier it is to develop an evaluation work plan afterwards. By doing so, the quality of evaluation itself may be improved.

We do not have to cover all the criteria with a full set of evaluation questions. We

need to be careful *not to automatically set evaluation questions based on the five criteria, but to develop the main questions that would give useful answers for improving the project*. Accordingly, emphasis among criteria may be different. For an internal evaluation with the purpose of improving projects, the results will be irrelevant unless the major concerns of JICA staff and other stakeholders are reflected in the evaluation questions. Their concerns and interests are the starting point of the evaluation. In that process, we can *prioritize which critical questions to address.* The budget and time for an evaluation is usually limited, and it is often difficult to answer all questions. JICA staff should fully discuss with other stakeholders what to intensively investigate and then select important evaluation questions.

Explained below are the relationships between the Five Evaluation Criteria and evaluation questions. *Good evaluation questions will make it easy to identify the necessary data and indicators in an evaluation study*.

Figure 2-2-1 Conceptual Model of How to Break Down a Main Question
(A Case of Terminal Evaluation of
"Math and Science Teachers Training Project")

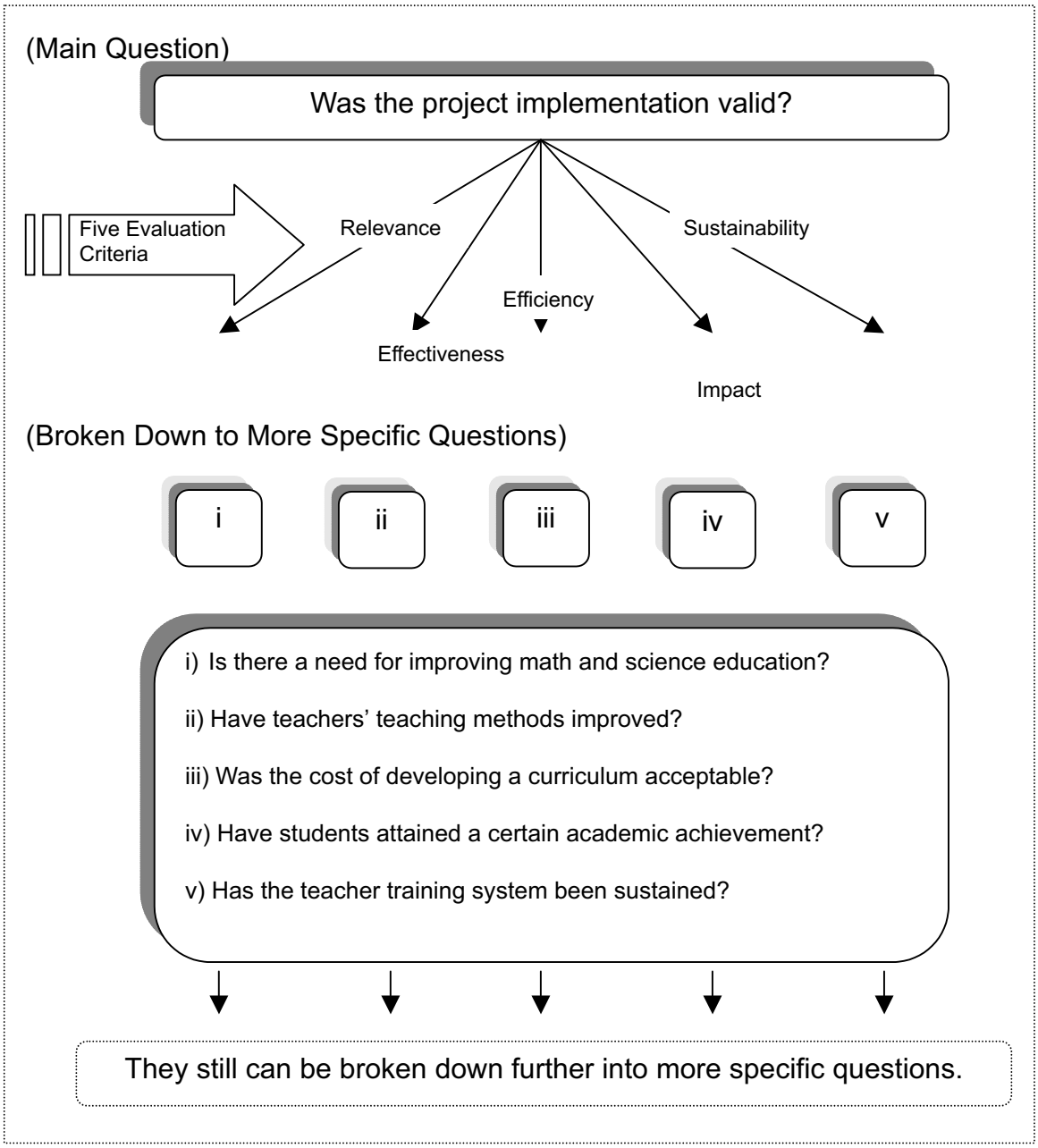


Figure 2-2-2 An Example of Evaluation Questions: main questions and sub-questions

The Case: Irrigation Management Training Course

Was the project effective? (effectiveness)

→ Did trainees acquire enough knowledge through training?

- Did trainees acquire knowledge on the maintenance system of irrigation facilities and the establishment and management of a water management cooperative? (test scores and report grades)
- Are trainees satisfied with the training program? (questionnaire survey)
- Do trainees receive good assessment about their work from their supervisors after returning home? (questionnaire survey)

The first question of the example above is too general. For instance, it is not clear what "trainees' knowledge" means and how to judge "the increase in their knowledge." Breaking down the first general question into the three specific questions makes it easier to consider a "basis for judgment," the "necessary data" and the "data collection methods." Some questions may be further broken down until one can imagine exactly what data should be collected.

The Case: Polio Eradication Project

Will the project be sustainable? (sustainability)

- Is the polio vaccine supply plan workable?
- Is funding assured for maintaining and managing the vaccine storage system?
- Will the health education for the local people be continuously provided? (→ it is also necessary to further break this down into specific questions focusing on such issues as training of health volunteers and development and delivery of textbooks, etc.)

(2) Perspectives of Five Evaluation Criteria

As explained in previous section, the Five Evaluation Criteria are used to evaluate a

target project from various issues of view and, in the process, to identify the hindering and contributing factors. Based on those factors, good lessons learned and recommendations can be formulated. Table 2-2-1 shows main perspectives of each criterion. They can be referred to when developing evaluation questions. Figure 2-2-3 shows the conceptual relationships between the Five Evaluation Criteria and the logframe. As is explained, the information of a logframe may not be enough to conduct a comprehensive evaluation according to the five criteria.

The appropriate evaluation questions for each criterion should be developed, referring to project documents and the logframe. The logframe provides information for narrowing and prioritizing the evaluation questions in a systematic way by highlighting the causal connections between project components (including outputs, activities and inputs) and outcomes (including overall goals and project purpose), as well as the assumptions underlying the project. If the logic in the logframe is correct, the evaluator may directly use the logframe's description of the project to formulate questions regarding its achievement level. On the other hand, if the logframe is not logically structured, the evaluator may have to create relevant evaluation questions together with the stakeholders.

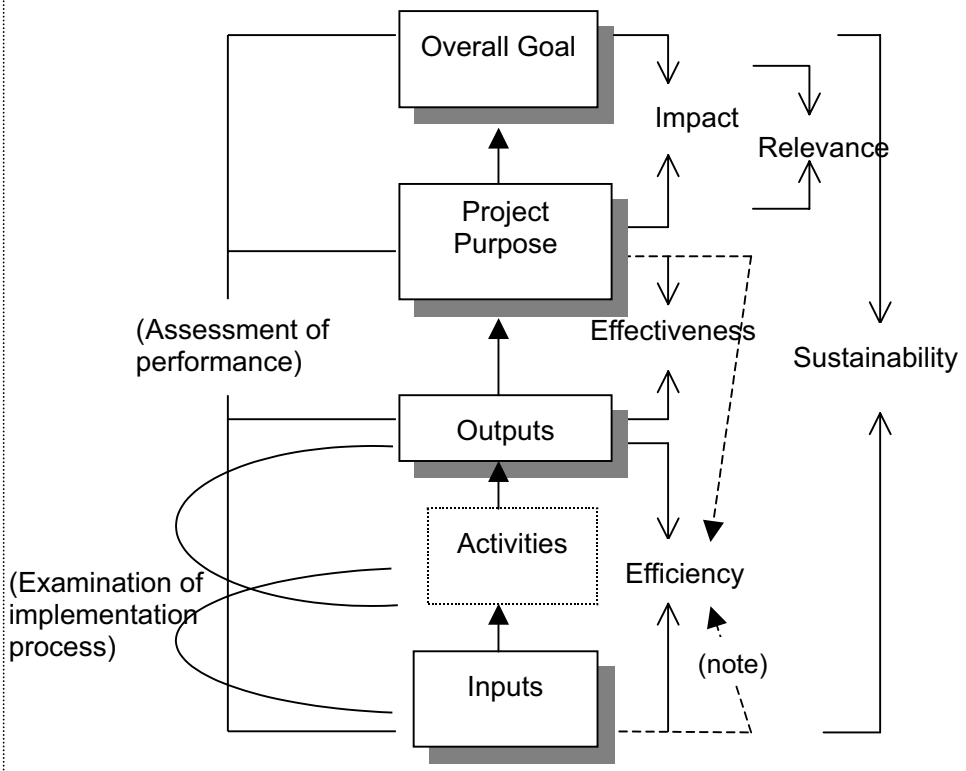
Table 2-2-1 Perspectives of Five Evaluation Criteria

Relevance To examine the justifiability or necessity for project implementation	**Necessity** ● Does a project match the needs of a target area or society? ● Does a project match the needs of target groups? **Priority** ● Is a project consistent with the Japan's foreign assistance policy and JICA's country programs? ● Is a project consistent with a partner country's development plans? **Relevance as a Means** ● Is project strategy producing impact on development issues in related sector of a partner country? (Are selected approaches, target areas or groups appropriate? Are there any synergistic effects of other donors' projects in the same sector? etc.) ● Are selected target groups considered appropriate (as a target or in the size)? ● Is a project relevant from the equality point of view? (Are project effects and costs equally shared? Is there any ripple effect beyond target groups? etc.) ● Does Japan have an advantage in extending technical cooperation in the related sector or sub-sector? (Is there any accumulation of know-how and experiences regarding target technologies in Japan? etc.)
Effectiveness To examine project effects	● Is the project purpose specific enough? (Are indicators and means of verification appropriate?) ● Has the project purpose been achieved (or is it going to be achieved)? ● Did (or does) the achievement result from outputs? ● Is there any influence of important assumptions on the attainment of the project purpose? What are the hindering/contributing factors for effectiveness?

Efficiency To examine project efficiency	● Was (or is) the cost of inputs justified by the degree of achievement of outputs? (This can be compared with the similar projects of other donors or of the partner country.) Were (or are) there any alternatives that would have achieved (or will achieve) same level at lower costs? Could (can) higher level of achievement be expected at the same costs? ● Was (or is) the cost of inputs justified by the degree of achievement of the project's purpose? (This can be compared with similar projects of other donors or of the partner country.) Were (are) there any alternatives that would have achieved (or will achieve) the same level at lower costs? Could (can) a higher level of achievement be expected at the same costs? ● What are the factors that inhibit or contribute to the efficiency of project implementation process? (examples) ・ Were inputs delivered in an appropriate timeframe? ・ Were the size and the quality of inputs appropriate? ・ Is there any influence of important assumptions on the process from inputs through output? ・ Is there any influence of preconditions? etc. ・ What are the hindering/contributing factors for effectiveness?
Impact To examine the project's effects including the ripple effects in the long term	● Has the overall goal been achieved (or is it going to be achieved)? ● Did (or does) the achievement of the overall goal result from the project purpose? ● Is there any influence of important assumptions on attainment of the overall goal? ● Is there any unexpected positive or negative influence including ripple effects? Conduct the study from various viewpoints such as policies, economics and finance, organization and institution, technologies, society and culture, and environment. Some examples of survey questions are: ・ Is there any influence on policies? ・ Is there any economic influence on a target society, project implementing agencies, and the beneficiary? ・ Is there any influence on the organization, related regulations and legal system arrangement? ・ Is there any influence on technological innovation? ・ Is there any influence on such issues as gender equality, human rights, disparities between the rich and the poor, peace and conflicts? ・ Is there any influence regarding the issue of environmental protection?

	etc. ● Is there any specific impact observed, either positive or negative, due to the differences of gender, race, and social class? ● What are the hindering and contributing factors for impact? What are unexpected factors that produced positive and negative influence?
Sustainability To examine the sustainability after the termination of JICA's cooperation	● Are the expected effects described in both the project purpose and the overall goal going to be sustained after the termination of assistance? ● What are the factors that inhibit or contribute to the appearance of those sustainable effects? Conduct the study from various viewpoints such as policies, economics and finance, organization and institution, technologies, society and culture, and environment. Some examples of survey questions are: ・ Is political support sustained? ・ Does the organization have the capacity to carry out activities? － Are the personnel located in appropriate manner? － Is the budget, including ordinary expenses, secured? － Does the decision-making process appropriately function? etc. ・ Are related regulations and legal system arranged? ・ Is the organization financially independent, or is the financial support continuously provided? ・ Are necessary technologies maintained and prevalent? Is the equipment appropriately maintained? ・ Would a negative influence on the social and cultural aspects, if any, become obstacles in carrying out activities? － Are there any negative influences on sustainability because of the lack of consideration to women, the poor, and the socially vulnerable? ・ Would a negative influence on the environment inhibit carrying out activities? ● Was (or is) the ownership of implementing agencies and related ministries assured?

Figure 2-2-3 The Relationship between the Five Evaluation Criteria and the Logframe (Conceptual Figure)



Note: In the past, the efficiency has been analyzed mainly based on the relationship between the inputs and outputs. However, the cost-effectiveness also should be verified by looking at the relationship between inputs and project purpose.

This figure mainly shows the relationship between the Five Evaluation Criteria and the Logframe. Logframe is only one of the information sources in an evaluation and one needs to look at other information as well. For instance:

- for "relevance," such information as development plans of a partner country, background of project, the needs of the beneficiary, project strategies, and the formulation of plans is needed;
- "efficiency" needs to be analyzed from three viewpoints: 1) productivity; 2) cost-benefit; and 3) cost-effectiveness;
- for "impact," not only the overall goal described as an expected effect in logframe, but also unexpected positive and negative influences have to be investigated; the relevance of project strategies in a program's framework is also examined;
- for "sustainability," various questions have to be raised as is described in table 2-2-1; and
- for "effectiveness" and "impact," when examining the causal relationship between project implementation and effects, such aspects as internal conditions, implementation process, and unexpected external conditions should be included.

(3) How to describe the evaluation questions in an evaluation grid

All components of evaluation planning will finally be brought together in the evaluation grid. Examples of evaluation questions in the case of the "mathematics and science teachers training project" are as follows.

(An Example of Evaluation Grid Format)

Five Criteria	Evaluation Questions		Basis for Judgment	Data Needed	Data Source	Data Collection Methods
	Main Questions	Sub-questions				
Effective-ness		Breaking Down				

(The Case: Mathematics and Science Teachers Training Project)

Five Criteria	Evaluation Questions	
	Main Questions	Sub-questions
Effective-ness	Is the quality of education at the model school improved by the project?	Are the teachers' teaching methods improved?*
		Is the teachers' performance in class improved?**
		Is teachers' understanding of subject contents improved?***
	Are trained teachers continuously involved in education activities?****	
Impact	Are students' learning skills improved by the project?	Is the average score of the nation-wide annual test increased?
		Is the degree of students' satisfaction with their classes higher than before?

Note: It is meaningless to set evaluation questions unless the necessary data can be collected. The following data is supposed to be collected for the above mentioned questions.

* Comparison with the data obtained from the questionnaire survey that is supposedly carried out after the project.

** The utilization of data obtained from direct observations correlated to the checklists in monitoring activities.

*** Measurement by test scores.

**** Measurement of the ratio of teachers continuously working at the same school at the time of evaluation.

2. Basis for Judgment

(1) Confirming Target Values or Setting New Criteria

The assessment of a project's performance in and after mid-term evaluation needs achievement criteria (or target values) in order to judge whether the objectives were achieved as expected. Target values described in the indicators column can be utilized as such criteria. In case no target values are specified, an evaluator needs to set up the criteria for determining both the level of achievement and what to compare that achievement to. For instance, to evaluate a water safety level, one can apply the criteria for water quality set by the WHO. Another example is to apply the national average rate of infectious diseases to the target region to measure the changes after a health project. The evaluator and stakeholders have to fully discuss what criteria to use as a basis for judgment. (Refer to Box 2: Several Ways of Deciding Target Values.)

It is also necessary to consider what criteria to use in assessing efficiency. For instance, in order to evaluate the cost-efficiency of building an elementary school, such criteria as the total cost of similar projects, the average cost of building an elementary school in a target country, or the average cost of one built by other donors can be used. (Currently, the efficiency has not been analyzed from the cost aspect because the criteria for comparison are not available. Therefore, in most cases, the efficiency of implementation process has been qualitatively analyzed. The accumulation of data for comparison is in need.)

< Box 2: Methods of Setting Target Values >

- **Refer to the needs of the target group:** to set target values based on the standard expected by the target group.
- **Refer to the mean of the large region to which the target area belongs:** to set target values referring to the mean of the large region to which the target area belongs. (e.g., country, prefecture)
- **Refer to successful cases of similar projects:** to learn from experiences in successful cases of similar projects carried out under similar conditions. This is based on the idea that a target project should be as successful as those cases.
- **Refer to target values set by specialized agencies:** to use standard values set by specialized agencies – e.g., the criteria of water quality set by WHO.

(2) The Viewpoint of Examining Causal Relationships

In evaluating the effectiveness or the impact of a project, the evaluators should raise the causal question on whether the effects resulted from project intervention. Such a question is different than measuring a project's achievement through normative questions. Because a project is merely one intervention in a target society, we can not exclude the influences of other factors besides the project. For instance, an increase in farmers' income could be caused by an increase in the productivity of cash crops as a result of an irrigation project, or it might be the influence of totally different factors such as the farmers' working in the neighboring towns, other chances to get extra income, and so on. In other words, the effects of a project can not be measured only by looking at the changes of target beneficiaries. Usually there are two methods to prove causality: 1) quantitative methods by "comparison;" and 2) qualitative methods of constructing information, trying to prove interrelation between the project outputs and outcome.

i) Quantitative Methods: Experimental Design Method, etc.

The basic methodology of quantitative methods to examine causal relationships is "comparison." There are two ways of comparison: 1) to compare a target society/beneficiary *before* and *after* a project is conducted to see their changes; and 2) to compare a target society/beneficiary *with* a project and another society/people *without* project.

The most scientific method is said to be the one called "the experimental design method," which is a combination of *before/after* and *with/without*. There are two steps in conducting the survey: 1) to choose people as the target group and another people as the non-target (control group) at random before implementing a project; and 2) compare their changes *before* and *after* the project. However, these methods raise ethical concerns and require a comparatively higher cost, and thus can not easily be applied for evaluating individual projects in reality. However, it is possible to conduct a simple comparative survey between those who participated in a project and those who did not, even though those groups are not chosen at random. (For instance, to compare people's perception towards health care in a target region of a PHC project and those in another region in the similar environment without the project; this method is called "the quasi-experimental design method.")

When evaluating individual projects at JICA, in many cases, *before* and *after* comparison of the target group is applied. The baseline data obtained in ex-ante evaluation will be used to compare results after the project. Another way of examining causal relationships is to regularly measure data and see the transition and its tendency in a time series.

ii) Qualitative Methods

Qualitative analysis of causal relationships tries to explain the relationship between the project implementation and the changes in its beneficiaries. Such analysis brings together (or *constructs*) various sources of information about the project in order to ascertain what kind of causal relationship exists between the project and the effects upon the target society.

There are several qualitative ways to analyze causal relationships as described below.

Qualitative approach to analyze causal relationships
● Construct information on implementation process from inputs through activities to outputs, and from outputs to objectives. ● Attempt to explain the logical relationship between project implementation and effects. ● Analyze the process to transfer and disseminate technologies through activities. ● Clarify the relationship between project implementation and effects by conducting detailed and in-depth survey of a target region or a target group of small size (e.g. case study).

In constructing information on the implementation process and assessing causal relationship, the qualitative data such as how activities are carried out, whether outputs are achieved as expected, how a target group's perception towards the project changed, or when the effects were produced may be collected and interpreted, in which qualitative analysis methods can be utilized. (Refer to table 2-2-4 for the methodology)

Both quantitative and qualitative methods can be combined and used complimentarily. For instance, after the assessment of performance before and after measurement, we can utilize qualitative methods to make the explanation more persuasive. This is often the case with evaluations of individual projects at JICA.

(3) How to describe basis for judgment in evaluation grid

In the evaluation grid, a "basis for judgment" column is not necessarily filled in depending on the evaluation questions. The relevance and the sustainability issue may not require such a basis because qualitative data is mainly collected. An example of the use of the evaluation grid with basis for judgment is shown below.

(An Example of Evaluation Grid Format)

Five Criteria	Evaluation Questions		Basis for Judgment	Data Needed	Data Source	Data Collection Methods
	Main Questions	Sub-question				
Effective-ness		Breaking Down				

(The Case: Science Teachers Training Project)

Five Criteria	Evaluation Questions		Basis for Judgment
	Major Items	Minor Items	
Effective-ness	Is the quality of education at the model school improved by the project?	Are the teachers' teaching methods improved?	-Comparison with the target value (the mean value is no less than 3.0) -Comparison between before and after implementation
		Is teachers' understanding of subject contents improved?	-Comparison with the target value (the average score is no less than 80 issues) -Comparison between before and after implementation
Impact	Are students' learning skills improved by the project?	Is the average score of the nation-wide annual test improved?	-Comparison of results after implementation with students without project
		Is the degree of students' satisfaction with their classes higher than before?	(Qualitative Data)

< Box 3: The Experimental Design Method and the Quasi-experimental Design Method >

The experimental design method is a method for examining causal relationships between effects and project implementation by comparing a group with a project (an implementation group) and a group without a project (a comparison group or control group). It is hard to examine causal relationships between the changes made and a specific project only by comparing before and after project implementation because of the influences from exogenous factors. The method is meant to estimate the "net effects" of a project intervention by detracting changes of a control group from the changes of an implementation group between before and after project implementation.

There are two cases of evaluation using a comparison group: 1) the case in which a comparison group already exists; and 2) the case in which evaluators formulate a comparison group at the time of evaluation. The more scientific (or theoretically effective) way to use comparison group is to choose both groups in a target region at random before the project launches.

When actually conducting a development assistance project, it may cause some difficulty to decide an implementation group and a comparison group in advance. There is an ethical issue in controlling and observing a group that is excluded from development benefits during the three to five years of the project period. Also, there is an issue of the cost.

The more easily usable method is to specify a comparison group that may have similar conditions to an implementation group, and to compare effects between them. This method is called the quasi-experimental design method, and two comparison groups of almost the same size with similar characteristics are compared. (This method is also called the matching model.)

For instance, it is possible to compare the situation after project implementation between village A where regional health care activities are conducted and village B without those activities. The village B needs to have a similar tendencies to village A in such conditions as gender ratio, number of households, kinds of infectious diseases, the actual situation of medical care services, the annual rainfall, or the geographic condition. Also, it is possible to further compare the selected groups of some specific characteristics (different age groups, different sex groups, different profession groups, etc.).

(Sources: Ryu Yoshiaki, Ryo Sasaki (2000), *'Seisakuhyoka' no riron to giho (Theories and Techniques of 'Policy Evaluation')*, Tagashuppan, p. 50-71; Lipsey RF (1999), *Evaluation: A Systematic Approach, 6th ed,* SAGE, p. 279-306.

3. Considering Necessary Data and Information Sources

The next step is to identify what data should be collected from what sources in order to answer evaluation questions. The task of identifying the necessary data is part of the process of finding out the specific indicators for measuring a phenomenon. For instance, an evaluator should decide a method of measurement: for instance, whether "the richness" should be measured by the annual income or the number of livestock in particular situation of the project. There usually are several ways of measuring a phenomenon, and thus the most appropriate measurement should be selected.

(1) Types of Data

There are two types of information or data to answer evaluation questions: 1) quantitative data; and 2) qualitative data. The different nature of each type of data should be realized because it affects data collection and analysis methods in an evaluation study. (Refer to 2-2-4 for quantitative analysis and qualitative analysis methods)

i) Quantitative Data

Quantitative data is the data expressed in numerical values (e.g., the harvest volume of agricultural products, the literacy rate, the infant mortality rate, the area of irrigation land, the number of facilities built, and the average test score). Quantitative data is used more to assess project performance or the degree of achievement in numerical values: e.g., to calculate the average income of a certain group by statistical analysis, and to see the correlation between the academic history and the income. Quantitative data is also suitable for analyzing the situation of a relatively large-size group by conducting sampling surveys.

It is possible to quantify those "qualitative aspects" – that are not so easy to directly measure in numerical values – through a questionnaire survey with multiple choices or through observation with the check list. For example, in order to investigate the degree of people's satisfaction, an evaluator can calculate the percentage of satisfied people by preparing five multiple choices: 1) fully satisfied; 2) moderately satisfied; 3) neither satisfied nor unsatisfied; 4) a little unsatisfied; and 5) totally unsatisfied. One can then calculate the mean value of the degree of satisfaction by coding these choices with numbers from five to one respectively. When measuring changes in people's attitude or perception, it becomes possible to quantify the changes by defining "the attitude" or "the perception" in concrete terms. For instance, in order to analyze how teachers' attitudes and teaching methods changed after receiving training, those changes may be defined as "adopting a

participatory method in class," "the attitude towards students not being able to keep up with the progress of the class," "the way of teaching with limited experimental tools," or "the way of fostering students' creativity." These can be measured through observation by a third party or through a questionnaire survey for teachers.

Because quantitative data is systematically and uniformly collected, it may be more reliable and easier to analyze. However, background information such as the reason why a phenomenon is observed and how the status quo is achieved cannot easily be obtained.

Quantitative data is applied to
● Measure project performance or the degree of achievement ● Investigate a large number of people ● Use established measurement methods ● Conduct statistical analysis

ii) Qualitative Data

Qualitative data is the data expressing a phenomenon in a descriptive way, and thus it is suitable for understanding the situation in depth or for understanding the people's behavior and their perception in detail. Qualitative data can provide more detailed information including influential factors, the process of changes, episodes, and relationships among them in a project. Most of the information on the implementation process is qualitative data, and this kind of information includes the problems and measures taken in the process of activities, the management process, human relationships, and the perception of stakeholders towards the project. Such data can be analyzed to learn how these factors influenced the attainment of objectives and what hindering or contributing factors exist. The analysis using qualitative data is more inductive compared with quantitative data, and therefore, the interpretation tends to be more biased.

Qualitative data is applied to
● Conduct in-depth surveys with detailed information ● Analyze related factors (hindering/contributing factors) that influenced the achievement ● Use when analytical methods are not decided in advance ● Use when there is no need for quantification

Table 2-2-2 Examples of Quantitative Data and Qualitative Data

(The Case: Mathematics and Science Teachers Training Project)

Examples of Quantitative Data	Examples of Qualitative Data**
■ The number of participants in training ■ The number of teachers trained ■ Students' test scores ■ The index to measure the quality of teaching methods*	■ What people felt were unsatisfactory with the contents of training, or their suggestions for the training ■ Changes in students obtained from their parents' viewpoints ■ Changes in teachers' perception towards the project ■ Reasons why teachers' teaching methods were not improved ■ The appropriateness of the implementation system of teachers training courses
*The quality of teaching methods cannot quantitatively be measured directly, but can be dealt with as quantified data in the case that a measurement method of the quality is invented (e.g., the evaluator can rate their observation results of teaching methods using the scale from one to three).	**These types of data can be quantified if a questionnaire survey with multiple choices is adopted (they are collected as quantitative data). On the other hand, the qualitative data is collected in such cases when multiple choices are not available in advance or when the purpose of survey is to better understand the situation (examples of data collection methods are: the questionnaire survey with open-ended questions or the interview survey, the focus group discussion, etc.).

(2) Data Sources and Sampling

Two major sources of data for the project evaluation are the existing materials and the information from stakeholders of a project. These sources should be consulted first to save cost and time. When using those data, the evaluator should confirm how they were collected and analyzed, and how important they are for the particular evaluation study.

The evaluators should select the appropriate data sources by considering the accessibility to information, whose information is more accurate, and whose

viewpoints are indispensable. Differences of gender, ethnicity, and social classes are also carefully examined when collecting and specifying data.

Necessary data may not be obtained as expected even from supposedly the most ideal information source, if data collection methods are not appropriate. For instance, in a society where women cannot raise their voices in the presence of men, data should be collected in circumstances where men and women are separated. When local people may not express their true feelings to outsiders, it may become necessary to train local people as surveyors to carry out data collection.

When conducting surveys on a number of unidentified beneficiaries, we can proceed with either: 1) a “census survey” in which all people (or a population) are the target; or 2) a “sample survey” in which only a part of them is the target. Which to choose depends on the survey purpose, the size of the target group or target region, the restrictions of budget and time, and the accuracy of expected data. The merit of the sampling survey is that the results of the survey can be generalized as characteristics of a target population. (Refer to “Box 4: The Census Survey and the Sample Survey.”)

＜Box 4: Census Survey and Sample Survey＞

- **Census Survey**

The census survey is the type of survey in which all who have been involved in a project are the sources of data collection. This survey is effective when gathering quantitative data, such as “the percentage of the increase in the number of farmers that attained higher productivity of rice” or “the percentage of the increase in the number of people who gained knowledge on health.” The factors that influenced the results can be estimated by statistically analyzing the living condition of the target people.

It is relatively easy to conduct a census survey on a small sized project, a pilot project, and a training project. In a large sized project, it is more difficult to obtain information on all people, but if it focuses on a certain group of people who participated in a certain activity, a census survey is also usable.

- **Sample Survey**

The sample survey is the type of survey which estimates the characteristics of an entire population through survey on the selected part of it. The sample size has to be decided within the range of acceptable sampling error. The margin of sampling error is +/– 5 percentage points when the sampling number is around 400, while +/– 10 percentage points for 100. For instance, in the case that 40 percent of 100 samples are found to have agreed to certain opinion, it can be estimated that 30 to 50 percent of the whole population agreed to it. It can be considered within an acceptable range if a sampling error is less than 10 percent, and thus the sampling number of 100 or more is desirable. There largely are two types of sampling: 1) random sampling; and 2) nonprobability sampling.

Source: Atsuko Isoda (2003), “Chapter 3: Joho/Deta no Shushu to Bunsekishuho (Methods of Information and Data Collection and Analysis),” Ed. NPO Corporation Ayus, *Kokusaikyoryoku Purojekuto Hyoka (Evaluation of International Cooperation Projects)*, International Development Journal, p. 77-79.

< Box 5: Theoretical Sampling”>

The sample survey is also called “statistical sampling” and is mainly used in quantitative analysis. In contrast, in qualitative analysis, what is called ‘theoretical sampling’ method is widely used. (Refer to 2-2-4 (3) p. 91 for quantitative and qualitative methods.)

Theoretical sampling is usually applied in generating theory and categories based on the findings of evaluation that are grounded in the empirical world. It directs the evaluators where to collect what kind of data responding to various concepts that are still in the process of construction. In other words, theoretical sampling is the process for identifying samples through repeatedly collecting and analyzing data related to concepts and categories.

For example, when measuring the outcome of a technical cooperation project, the qualitative aspects of the attitudes and behavioral changes of beneficiaries and target organizations are often investigated. In that case, theoretical sampling method together with a logic model may be utilized to conduct an evaluation. The evaluators can first identify a group of key informants who are theoretically considered to be an important and effective data source, and then conduct interviews or focus group discussions to assess their changes of attitudes or behavior. In analyzing the collected data, another data source can be identified who may be related to the factors and incidents resulted from the previous survey. Such a repeated process may be ended when no other new findings are expected.

4. Data Collection Methods

(1) Types of Data Collection Methods

The main methods of collecting data are shown below. Some methods can be applied to collect both quantitative and qualitative data depending on the structure of questions and responses. For example, data can be quantified in a questionnaire survey with response options prepared (e.g., 80% of respondents are satisfied), whereas only qualitative data is available if it is structured with open-ended questions.

Types of Data Collection Methods
● Reviewing statistics, literature, and existing data ● Observation ● Questionnaire survey ● Interview ● Focus group discussion

Collecting data takes time and money, and thus the availability of existing credible data is the first thing to be investigated. Each method has merits and demerits, and the evaluator has to carefully select the appropriate methods for data collection. Table 2-2-3 and 2-2-4 show the characteristics of each data collection method for reference.

Table 2-2-3 Relationships between the Types of Data and Data Collection Methods

	Questionnaire Survey		Interview Survey	Focus Group Discussion	Observation	
	Structured questions	Open-ended questions			Observation Using the Checklist	Site Visits
Quantitative Data	○		△*		○	
Qualitative Data		○	○	○		○

*In the case that an interview is structured, it is possible to quantify results to some extent.

Table 2-2-4 Main Data Collection Methods and their Characteristics

Data Collection Methods	Merits	Demerits/Tips
1. Literature Review including Existing Data ✧ Project reports, monitoring records, literature in related sectors, statistical data, other donors' reports, etc.	● Less cost compared to other methods, and thus efficient.	● The credibility of information and data is the question. ● Necessary data may not be obtained.
2. Direct Observation ✧ The situation of facilities and the equipment use, the appropriateness of the infrastructure and services, the training site, the way of people's behavior, etc.	● Little cost.	● The results are influenced by surveyors' skills and biases. ● Objectivity has to be assured by combining with other survey methods. ● Skills for developing an adequate questionnaire are needed to obtain necessary data.
3. Questionnaire Survey (Enquete Survey) ✧ Ask all targets the same questions using a questionnaire and analyze the data obtained. ✧ There are two types of questionnaires: 1) the self-administered questionnaire which respondents directly fill in; and 2) the questionnaire with which a surveyor asks respondents questions and takes notes of their answers (non self-administered).	● It is possible to obtain information on a subject at once from numerous targets. ● Respondents' answers can easily be compared. ● Analyzing answers of closed-ended questions is relatively easy because they can be quantified.	● All important information may not be covered if the size of a population for a survey is limited. ● Response rates are not predictable. ● There is no opportunity for respondents to clarify the intentions of questions due to the lack of chances for direct conversation. (Tips) ● Formulate questions with simple words and expressions so that respondents can understand the intentions of questions.

✧ There are two types of questions: 1) closed-ended questions for which specific response options are provided; and 2) open-ended questions for which respondents answer in their own words.		● Pay enough attention to write a request letter in a proper way. ● Take into consideration social and cultural backgrounds and ways of expression so that the intentions of questions are properly conveyed. ● Do not make the volume too large. ● Select types of response while taking into consideration data analysis methods.
4. Interview Survey ✧ There are some types of interviews depending on the target – individual interview, group interview, key informant interview, etc. ✧ There are three types of interviews depending on the structure of questions. ① Structured Interview: Specific questions are prepared, same as in the questionnaire survey.	● It is possible to flexibly deal with respondents, depending on the situation. ● It is possible to further obtain information from respondents' reactions – e.g., facial expressions, voices, etc. ● It is possible to ask additional questions to obtain more details.	● It takes time. ● The results are influenced by interviewers' skills. ● The results can be influenced by individual bias. ● In many cases, it is not possible to quantify data and thus, generalize results. (Tips) ● Create questions assuming a smooth conversation. ● Avoid long questions or a large volume of questions. ● Try to obtain information also through observation of respondents' facial expressions, attitudes, etc.

② Semi-structured Interview: Main questions are prepared. Some additional questions are asked when necessary during the interview. ③ Unstructured Interview: Only the intention of the interview is clarified. Questions are freely asked for each respondent.		● It is not suitable for sensitive topics. ● A few respondents may control the discussion. ● Respondents may not express their true feelings if the topics are related to social norms.
5. Focus Group Discussion A group of around 10 persons with the same background discusses specific topics (or questions). Their perception towards the topics or ideas can be obtained through observing the discussion.	● It is relatively easy to conduct it. ● Through participants' interactions, information on specific topics is obtained from various viewpoints. ● Objections are easily heard.	● Discussions are influenced by facilitator's skills (capable facilitators are needed). ● Carefully select members (maximum 12 persons). ● Have someone make a record of the discussion.

In the questionnaire survey or the interview, results may easily be influenced by the way questions are formulated. Even though a questionnaire survey is conducted for the whole population, or for key respondents who may have important information, it might not be possible to obtain the necessary data as expected unless questions are appropriate and operational. Described below are some tips regarding how to prepare questionnaires and questions by different methods of data collection.

Table 2-2-5 Tips to Prepare Questionnaires and Questions

Questionnaire Survey (Enquete Survey)	● Use clear and simple words and expressions. ● A sentence should be simple, not too long. ● Do not ask two or more things in one question. ● Avoid using double negative sentences. ● Do not use leading questions. ● Include questions for double-checking. ● Include some options which allow respondents not to respond – e.g., not applicable, no opinion, etc. ● Keep the total volume modest, not too large (two to three pages at most). ● Stipulate the evaluation purpose (the survey purpose) and confidentiality. ● Do not forget to express appreciation for cooperation. ● Social and cultural aspects should fully be considered and sensitive wording avoided.
Interview (The case of the unstructured interview is assumed here; the tips for the structured interview is considered similar to the questionnaire survey, which is described above).	● Start with general/simple questions before asking personal/difficult questions. ● Decide the order of questions assuming a smooth conversation – e.g., arrange related topics one after another (however, an interviewer may skip some questions depending on a respondent's answers). ● Prepare main questions reflecting the intention of interview, and ask additional questions accordingly. An interviewer should always keep in mind the intention of interview. ● Social and cultural aspects should fully be considered, and sensitive wording should be avoided. ● Plan the time schedule, the contents of interview, and the orders of questions in advance so that the interview will be finished within the time limit.
Focus Group Discussion	● Set a main question or a theme, and avoid asking new questions until participants finish discussing it. ● Do not ask questions to be answered by yes or no. ● Ask such questions so as to grasp reasons, causes, and backgrounds of behavior or opinions.

Source: Atsuko Isoda (2003), "Chapter 3: Joho/Deta no Shushu to Bunsekishuho (Methods of Information and Data Collection and Analysis)," Ed. NPO Corporation Ayus, *Kokusaikyoryoku Purojekuto Hyoka (Evaluation of International Cooperation Projects)*, International Development Journal, p. 71-112

(2) Combining Different Data Collection Methods

In order to maximize the merits and minimize the demerits of each data collection method, several different methods should be combined. For example, a questionnaire survey can be conducted to complement existing data. Or, a focus group discussion among local people may be conducted to know their perception after an understanding of the general tendency has already been learned through a questionnaire survey. It is also possible to carry out a survey using both quantitative and qualitative data collection methods. It is important to consider the combination of several methods in order to reduce the biases of surveyors as well as respondents.

Some examples of combining methods are described below.

Combining different methods

- Facilitate a focus group discussion first to formulate questions for a questionnaire survey afterwards.

<Examples of Use and Merits>

- Grasp important issues by observing those concerned in a project and analyzing their perception through a focus group discussion, and reflect the results on a questionnaire survey.
- When setting specific response options for a questionnaire survey, refer to the results of a focus group discussion.

- Facilitate a focus group discussion after obtaining results through a questionnaire survey or literature review in order to further investigate the background information.

- Facilitate a focus group discussion to understand factors that affected the project. Such a discussion can help explain the reasons for and the background behind the results of the questionnaire survey (ask participants the reason why the results are obtained).
- Ask participants about supporting evidence for data in monitoring reports (e.g., in the case that the performance was low) and influential factors.

- Conduct a questionnaire survey at the end of a group interview.

- The respondents may understand the intention of a questionnaire survey in advance.
- It is easier to obtain respondents' cooperation for a questionnaire survey.

- Use some open-ended questions in a questionnaire survey together with multiple choices.

- It may be possible to know respondents' perception in a way that may not be obtained through analyzing the closed-end questions.

- Using the same questions, carry out a group interview with several informants.
  - It is possible to know how different stakeholders perceive a specific phenomenon.
  - The data could be more credible.

< Box 6: Triangulation >

Triangulation is done in order to apply multiple data collection techniques to make most use of the merits and minimize the demerits of each data collection. This approach tries to grasp the whole reality by examining a phenomenon from different angles, since a single method may only describe one side of the reality. In evaluations, the following 4 kinds of triangulation can contribute to the verification and validation of qualitative analysis.

1. ***Methods Triangulation****:* Checking out the consistency of findings generated by different data collection methods
2. ***Triangulation of Sources****:* Checking out the consistency of different data sources within the same methods
3. ***Analyst Triangulation***: Using multiple analysts to review findings
4. ***Theory/Perspective Triangulation***: Using multiple perspectives or theories to interpret the data

(3) Types of Data Analysis Methods

JICA staff is not directly involved in the task of analyzing collected data. However, they should have basic knowledge of data analysis methods so that they can plan evaluation studies and create the Terms Of Reference (TORs) for consultants. If they are familiar with the different characteristics of data analysis methods, it will help them decide the appropriate evaluation work plans. There are two types of data analysis: 1) quantitative analysis; and 2) qualitative analysis – exactly the same as the types of data. They should be utilized complementarily.

Quantitative analysis demonstrates the degree of achievement or causal relationships using quantitative data based on statistics grounds. It tries to present the evaluation results as scientifically as possible.

On the other hand, *qualitative analysis* uses qualitative information obtained from a literature review, interview, or a focus group discussion, etc. The set of analytical tools is not prepared in advance, and in the process of data analysis, the meaning of data, new facts, or relationships between factors may be deductively constructed.

The results of qualitative analysis may be influenced by the biases of both respondents and analysts. In order to assure the objectivity of the findings, such measures as having a third party conduct the analysis or combining with other data collection methods should be incorporated. One of the merits of qualitative analysis is its ability to obtain detailed information about local target populations and people's behavioral changes. The results of qualitative analysis can be utilized as supporting evidence for the results of quantitative analysis, and thus can help to identify the various factors influencing project performance.

< Box 7 : Basic Quantitative Analysis Methods >

- **Simple Aggregation and Simple Statistical Analysis**

The basic quantitative analysis method deals with a single variable. This method is suitable for examining the degree of achievement or for comparing that achievement with target values. Although being a simple method, it provides meaningful data, and thus is useful for carrying out evaluation. Types of analysis are described below.

- Frequency (e.g., the number of persons who answered "yes" and that of persons who answered "no")
- Percentage distribution (e.g., the ratio of persons who responded per 100 persons)
- Central tendency (the mean, the mode, the median)
- Standard deviation (to see how far the values are distributed from the mean)

- **Cross Aggregation**

This type of statistical analysis method sees how each of the persons who responded in a certain way to a question responds to another question, or the tendency of responses depending on the attribution. For instance, by creating a table (a cross-tabulation) composed of two variables: 1) the row variable is "practice of hand-washing"; and 2) the column variable is "the participation in the hygiene campaign," we can estimate the frequency or the ratio of people who practice hand-washing based on whether they participated in the campaign. This method is useful for comparing between a target group with a project and a control group without any project (with/without) , or to examine the influences of a project on different groups.

- **Correlation Coefficient**

This type of statistical analysis method examines whether there is a linear relationship between two sets of numerical values for two variables (e.g., data of the income level and that of the education level). There are two types of relationships in that direction: 1) a positive relationship in which an increase in the value of one variable is accompanied by an increase in the value of the other; and 2) a negative relationship in which a decrease in the value of one variable is accompanied by an increase in the value of the other.

- **Multivariate Analysis**

This type of statistical analysis method deals with three or more variables. Multivariate analysis includes "multiple regression" to analyze multiple variables and "factor analysis" to analyze the degree of other factors' influences on a variable. This method is used to examine causal relationships between variables in which a correlation is estimated, and requires a special analysis software.

(Source: Atsuko Isoda (2003), "Chapter 3: Joho/Deta no Shushu to Bunsekishuho (Methods of Information and Data Collection and Analysis)," Ed. NPO Corporation Ayus, *Kokusaikyoryoku Purojekuto Hyoka (Evaluation of International Cooperation Projects)*, International Development Journal, p. ??.)

< Box 8: Basic Qualitative Analysis Methods >

- **Explain the Situation**
  Convey to readers (those who might utilize the qualitative data) the whole picture of a project including what is happening at the project site, how stakeholders are perceiving the project, and in what situation specific activities or events are being implemented, etc.

- **Classify Information According to Patterns and Issues**
  Find out information or the results of observations that can be classified under the same issue or concept and bring them together in a group. This is similar to the task of creating indices in a filing system. Data may not only be labeled, but also classified. It is effective to conduct this task with two or more persons respectively and compare each result with the others'. This is because different persons may analyze data from different viewpoints, and thus comparing results can reduce the biases of analysts. The classified data can be used to identify the relationships between specific themes and the target project.

- **Examine Relationships within Information**
  Another method of qualitative analysis is to examine the relationships within information. The situation and issues of a project can be understood by logically classifying qualitative data into such categories as the process and effects of the project. Tables or flowcharts may be helpful to identify those categories and explain the relationship among them.

(Source: Michael Q. Patton (2002), *Qualitative Research and Evaluation Methods*, Sage, pp. 431-477.)

5. Formulating an Evaluation Grid

The last step of making an evaluation plan is to bring all the contents of planning together in an “Evaluation Grid,” a table of evaluation work plan (refer to table 2-2-7 showing an example). All components in the evaluation grid are interrelated to each other, and help us develop the most appropriate work plan for conducting an evaluation. In the process of creating the evaluation grid, we always have to keep in mind what is the most appropriate way to answer evaluation questions.

The evaluation grid should be used flexibly. There are no rules in the ways of description, and a new column (e.g., sampling method, gender ratio, etc.) can be added when necessary. The important thing is that the way of answering evaluation questions is clearly specified and the effective methods within limited sources are identified. After completing the grid, it is also important to properly reflect the contents of the grid on the questionnaire or a question sheet to actually conduct surveys.

In the case that stakeholders are directly involved in evaluation (e.g., joint evaluation with the partner country), they should share the common undertaking of the evaluation methods. By utilizing the evaluation grid as a communication tool, those concerned are able to share the ideas of evaluation. The quality of evaluation can be improved by fully utilizing the views and the experiences of stakeholders.

Table 2-2-6 Evaluation Grid Format

Evaluation Criteria	Evaluation Questions		Basis for judgement	Data Needed	Data Sources	Data Collection Methods
	Main questions	Sub-questions				
Relevance						
Effectiveness						
Efficiency						
Impact						
Sustainability						
Others						

Table 2-2-7 An Example of Evaluation Grid

(The Case: Mathematics and Science Teachers Training Project)

Five Criteria	Evaluation Questions		Basis for Judge-ment	Data Needed	Data Sources	Data Collection Methods
	Major Items	Minor Items				
Effective-ness	Was the quality of education at the model school improved by the project?	Are the teachers' teaching methods improved?	Comparison with the target value (the mean value is no less than 3.0) Comparison of before/ after	Average value of the Index to measure the quality of teaching methods	250 trained teachers	Question-naire survey
				Instructors' perception	30 instructors	Focus group
		Is the degree of teachers' understanding of a subject's contents improved?	Comparison with the target value (the average score is no less than 80 issues) comparison of before/ after	Average test score	250 trained teachers	Test
		Are trained teachers continuously involved in education activities?	Comparison with the target value (80 percent is still being involved)	Ratio of teachers still being involved	Project documents	Literature review