MONITORING AND EVALUATION GUIDELINES

-- FOR BETTER MANAGEMENT OF DEVELOPMENT PROJECT --

VERSION 1.0

NOVEMBER 2005

PREPARED UNDER THE TECHNICAL COOPERATION PROJECT OF JICA/PDMO

DEVELOPING THE CAPACITY OF THE GOVERNMENT

TO POST-EVALUATE EXTERNALLY FUNDED PROJECTS

MONITORING AND EVALUATION GUIDELINES

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I. INTRODUCTION

1. Purpose of the Guidelines

The Project Team[1] is pleased to print the first edition of Monitoring and Evaluation Guidelines for PDMO as part of our project activities. The objective of the Guidelines is to present to mainly for PDMO staff information on various existing tools aimed at facilitating evaluation at the project design, implementation or monitoring, and project completion, and operation stages, including ex-post evaluation of completed projects. Throughout the document, the word "evaluation" is used generically, that is, as the analyses conducted at all phases of the development process. But it may sometimes indicate “ex-post evaluation” in some context.

Evaluation is a useful tool to enhance project performance. This handbook is designed to provide users with guidelines in support of evaluation activities at all stages of the project cycle, in order to assist in improving project performance.

Sound project evaluation conditions must be established at the project design level, so that projects can be successfully monitored and evaluated. Unfortunately, this is not the current practice in development projects, not only in Thailand but also in other countries too. Only a few of the loan proposals contained the basic elements required to monitor result-based project progress, or to determine at a later point in time whether or not the development objectives were achieved. A tool can be used to improve this situation at the project design level. The logical framework can be incorporated in project designs in order to establish a clear project purpose at the design level. Assessment is also important to test if projects submitted for approval have the necessary elements to enable result-based evaluation at a later point in time. The means for incorporating these tools are described in this handbook.

Successful projects do not solely depend on valid project designs -- projects also require effective implementation. Many of the loan projects are experiencing difficulties in implementation. JBIC’s ex-post evaluations[2] show that of the 74

[1] The team members consist of JICA expert and OSU manager/staff of PDMO, working on the Technical Cooperation Project on Development the Capacity of the Government to Post Evaluate the Externally Funded Project, JICA/PDMO

[2] Country Review Report Thailand: Meta Analysis of Ex-post Evaluation Reports, JBIC 2003

projects evaluated by JBIC, 15% of them were delayed for more than three years and 45% of them were completed with one-to-three year delay. Similar situations are observed in the World Bank funded projects and ADB funded projects, too. This reinforces the need to improve project design and provide the means for effective monitoring of project implementation.

At the completion stage of a project, or some years later, most evaluations are conducted. If conducted carefully, ex-post evaluations can generate knowledge that is indispensable to the success of future projects. On the foundation of well-conducted ex-post evaluations, subsequent project designs and execution strategies can benefit from the collective experience. Effective ex-post evaluations and impact evaluations, described in this guideline, are also important instruments for improving overall performance over a long-term period.

The Project has produced this handbook as a guide that underscores the importance of evaluation as a learning tool of the project, from design to execution and monitoring, by developing standards for effective evaluation processes and products. This handbook would not be the quality product, but would be pleased to invite your thoughts and comments for continuing effort to provide the best evaluation products possible.

The Guidelines is a document designed to evolve and change as we learn from its use.

2. Structure of Guidelines

The Guidelines is divided into following four chapters. Chapter II is a general overview of evaluation, and project cycle and ex-ante evaluation, how the application of evaluation is essential to the design of the project at the project preparation phase. Chapters III-IV describe, the monitoring of the project at the project implementation phase, and the project's impact at (or after) the project completion phase. Chapter V discusses performance monitoring indicators, which is one of the most important elements of present monitoring and evaluation.

3. Quick Reference

Table I-1 Evaluation Terminology

Term	Definition
Effectiveness	The extent to which the project produced its expected outputs and thereby achieved its purpose and contributed to its goal.
Efficiency	The extent to which project inputs were supplied and managed and activities organized in the most appropriate manner at the least cost to produce the necessary outputs.
Evaluability	The extent to which a project has been defined in such a way as to enable evaluation.
Evaluation design	The parameters that define the evaluation and how it is to be undertaken, including the evaluation questions, methodology, data collection plan, methods of analysis.
Evaluation	An assessment -- as systematic and objective as possible -- of an on-going or completed project, programme or policy, its design, implementation and results. The aim is to determine the relevance and fulfillment of objectives, developmental efficiency, effectiveness, impact and sustainability of development. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process of both recipient and donors. (OECD/DAC, 1991)
Ex-ante evaluation	An appraisal or needs assessment. Also used for the "ex ante phase" of the evaluation cycle, which includes feasibility studies, identification of project objectives and other such functions done before the project begins.
Ex-post evaluation	An evaluation conducted upon the completion of project execution. In JBIC, ex-post evaluation is generally conducted 2 years after the conclusion of the project.
Impacts and Effects	As defined in the Logical Framework Analysis approach, impacts and effects refer to the planned and unplanned consequences of the project; effects generally relate to its purpose and impacts relate to its goal.
Indicator	The quantitative and qualitative specification for an objective, used for measuring progress toward attaining the objective.

Lesson Learned	A lesson learned is a general hypothesis based on the findings of one or more evaluations, but which is presumed to relate to a general principle that may apply more generally.
Monitoring	Monitoring is a procedure for checking the effectiveness and efficiency of implementing a project by identifying strengths and shortcomings and recommending corrective measures to optimize the intended outcomes. Monitoring in this context is a quality check or appraisal of activities of a whole system while it is actively in operation.
Project Cycle Management (PCM)	Management activities and decision-making procedures used during the life-cycle of a project
Project Performance	Project performance means achieving expected results within planned timeframes and resource limits.
Qualitative data	Data that use non-numeric information for description. Generally words, but may include photographs and film, audio recordings, etc.
Quantitative Data	Information expressed in the form of numbers. May be ordinal or ratio.
Reliability	The quality of a measurement process that would produce similar results on (1) repeated observations of the same condition or event, or (2) multiple observations of the same condition or event by different means.
Validity	The extent to which the conclusions of an evaluation are justified by the data presented.

II. PROJECT CYCLE AND EX-ANTE EVALUATION

1. The Project Cycle Management

The project operations usually follow a sequence of procedures. They are project identification, formation, appraisal (ex-ante evaluation), project implementation and supervision, project completion, ex-post evaluation and monitoring after completion of the project. The lessons learned from ex-post evaluation and monitoring after project completion provide useful information, and are fed back to the preparation, appraisal and implementation of future projects. Thus the whole series of procedures forming the circle is called the **project cycle**.

The cycle of operations[1] for managing development projects by PDMO has four phases, as shown in Figure II-1 below.

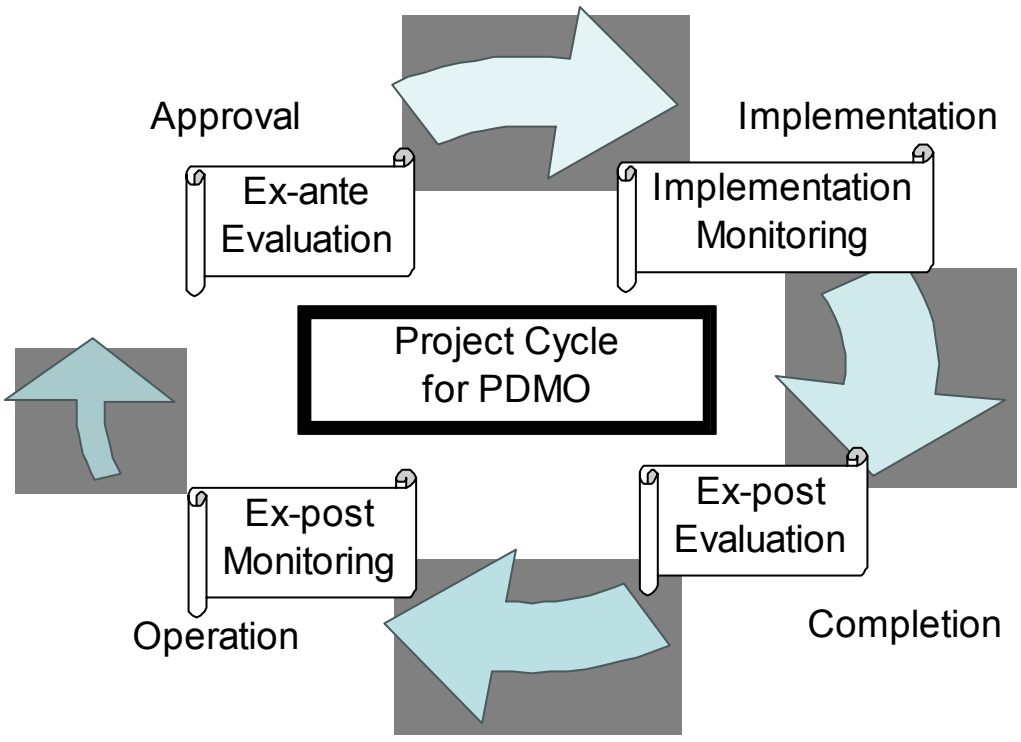


Figure II-1 PDMO's Project Cycle

[1] Project cycle normally has an identification/formulation stage. PDMO, however, is not usually involved in this stage. Therefore, it is dropped from the chart.

As another example, each step of the project cycle corresponding to the JBIC loan process is shown in the Figure II-2.

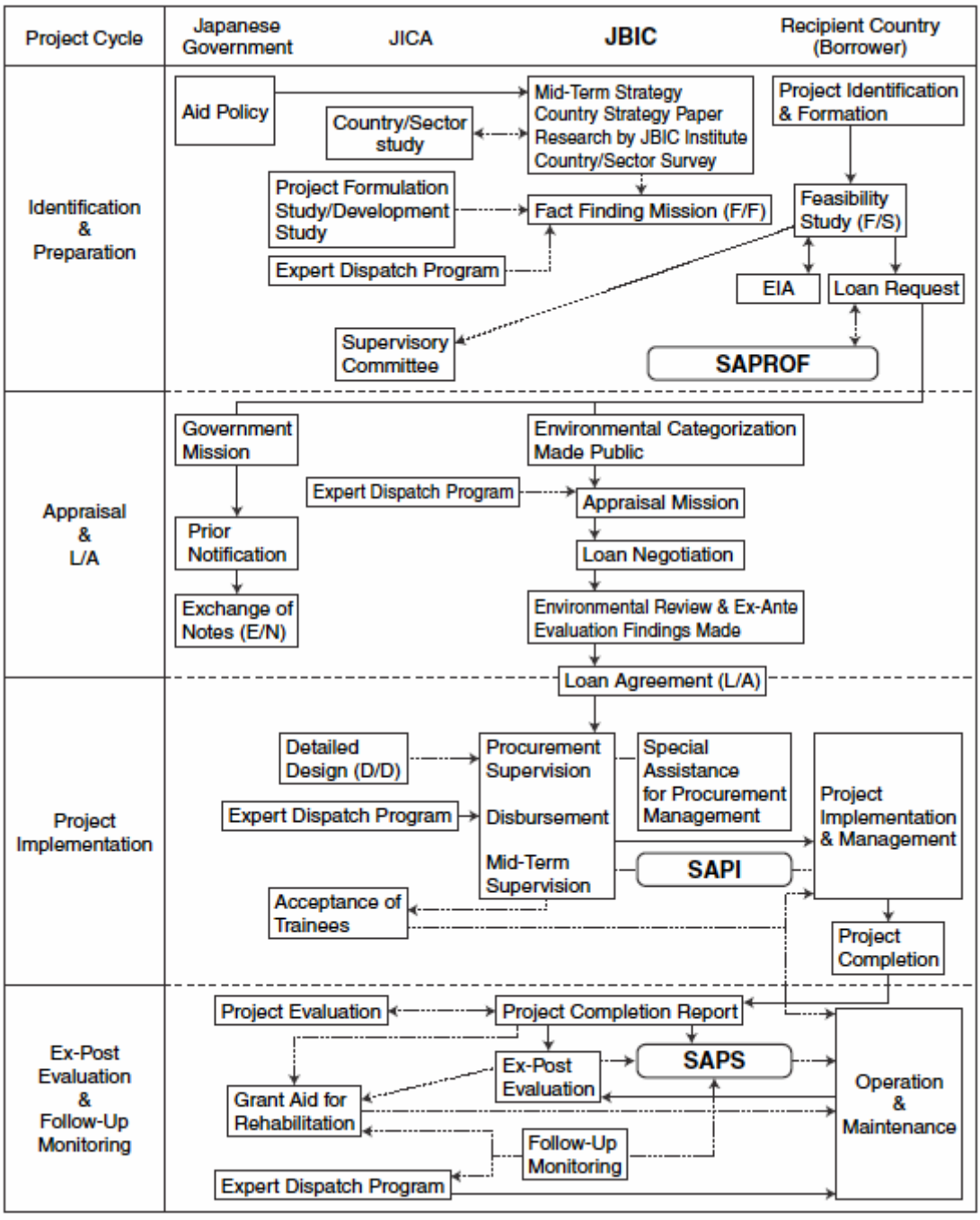


Figure II-2 Project Cycle and JBIC Loan Procedure

Project Cycle Management (PCM) is a term used to describe *the management*

activities and decision-making procedures used during the life-cycle of a project

PCM helps to ensure that:

- Projects are *relevant* to a *strategy* and to the real problems of target groups/beneficiaries;
- Projects are *feasible*, meaning that *objectives* can be realistically achieved within the constraints of the operating environment and capabilities of the implementing agencies; and
- *Benefits* generated by projects are likely to be *sustainable*.

To support the achievement of these aims, PCM:

- requires the active participation of *key stakeholders* and aims to promote *ownership*;
- uses the *Logical Framework Approach* (as well as other tools) to support a number of key assessments/analyses (including stakeholders, problems, objectives and strategies);
- incorporates *key quality assessment* criteria into each stage of the project cycle; and
- requires the production of *good-quality key document(s)* in each phase (with commonly understood concepts and definitions, such as Logframe, Progress monitoring report, Project completion report, Ex-post evaluation report, etc.), to support well-informed decision-making.

2. Logical Framework Approach of Development Project

The logical framework (also known as "Logframe") is a conceptual and analytical tool for undertaking sector analysis, project planning, and project management. The **logical framework process** is distinct from the **logical framework matrix**, which you may be familiar with. The **logical framework process** starts with the analysis of a sector and ends with the design of a project or program using the logical framework. Although the *PDMO is not involved in the entire process of logical framework exercise*, it is useful to know the process through which projects/programs are formulated.

A brief overview of this logical process is presented below, step by step.

Step 1: Assess Sector Performance

Sector performance is assessed by using performance indicators that reflect the contribution of the sector to the larger economy and to the quality of life of

people. Examples of sector indicators are “mortality” for the health sector, “productivity” for the industrial sector, and “traffic flows” for the transport sector. Each sector has its own set of indicators which, taken as a whole, reflect the performance of the sector.

Step 2: Identify Sector Performance Problems/ Opportunities

Problems or opportunities are identified as issues of concern. Such problems or opportunities are identified in relation to a specific sector performance indicator. Examples would be “rising mortality rates” or “deteriorating productivity” or “increasing traffic congestion”.

Step 3: Cause-Effect Analysis of Problems/ Opportunities

A core problem or opportunity is selected to improve sector performance. It is analyzed to identify the causative factors as well as consequent effects. It is usually diagrammatically presented in the form of a cause-effect tree. The effects of the problem indicate its wider dimensions and impacts on the economy. The causative factors identify the variables influencing the problem/opportunity and provide the basis for solution.

Step 4: Stakeholder Analysis

This analysis clarifies which groups are directly or indirectly involved in a specific development problem, their respective interests in relation to it; their perceptions of the difficulties related to the development problem; the resources (political, legal, human, and financial) they may contribute toward resolving the development problem; their respective mandates with regard to the problem situation; their reactions to a possible project strategy; and the existing or potential conflicts among stakeholders. The stakeholder analysis is an important source of information for the evaluation of the project during its execution, and thus it is important to identify the stakeholders and understand their roles in the execution of the project.

Step 5: Objectives Tree

The cause-effect tree is converted into an objectives tree, thereby providing the spectrum of possible actions that can be taken to address the problem or opportunity.

Step 6: Alternatives Analysis

Various courses of possible actions are derived from the objectives tree, all aimed at improving sector performance for the performance indicator being analyzed. The options are assessed against each other using specific criteria, leading to the choice of the most appropriate (efficient and effective) option in the

circumstances.

Step 7: Project Design Using the Logical Framework

The chosen course of action is translated into a logical framework that provides the basic design of the project or program in terms of its intended objectives, outputs and activities.

Logical Framework Matrix (Logframe or Project Design Matrix (PDM)) [2]

The core concepts underlying the logical framework are summarized as follows:

- The logical framework presents the key elements of a development project or a program.
- The framework clearly identifies the impacts or objectives the project or program will achieve. It also allocates measurable and/or tangible performance targets to them.
- The framework also clearly identifies the inputs and outputs the project or program will deliver to enable achievement of the proposed objectives.
- Thus, the framework presents a cause and effect matrix where inputs lead to outputs and outputs lead to immediate objectives, which in turn lead to longer-term objectives. This cause-effect relationship is depicted in the following figure.

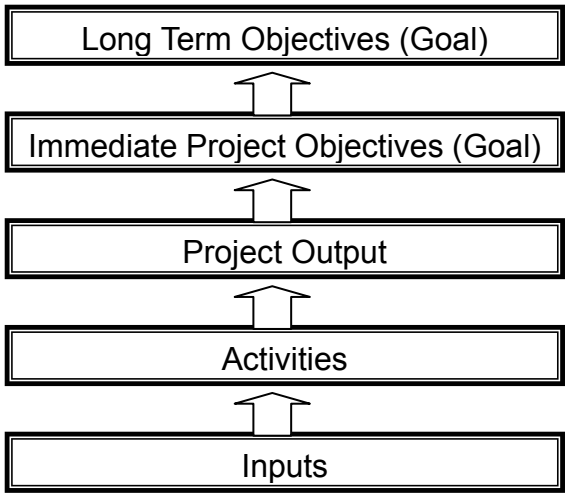


Figure II-3 Cause-Effect Relationships in Project Design

[2] For easiness of writing and reading, "**Logframe**" is used in the following part of this Guideline.

A brief summary of how Logframe can be used during project formulation, implementation, and evaluation is provided below.

Table II-1 Use of Logical Framework Approach

Project cycle	Use of Logical Framework Approach
Formulation	➢ The Logframe Matrix provides a summary of key project elements in a standard format, and thus assists those responsible for appraising the scope and logic or proposed investments. ➢ The objectives specified in the Logframe, combined with the activity, resource and cost schedules, provide information to support cost-benefit analysis ➢ The cost-schedules allow cash-flow implications to be assessed (including the contributions of different stakeholders), and the scope of Financing Agreements to be determined
Implementation	➢ The Logframe provides a basis on which contracts can be prepared – clearly stating anticipated objectives, and also the level of responsibility and accountability of project managers and other stakeholders ➢ The Logframe and associated schedules provide the basis on which more detailed operational work plans can be formulated ➢ The Indicators and Means of Verification provide the framework for a more detailed Monitoring and Evaluation Plan to be designed and implemented by project managers ➢ The Assumptions provide the basis for an operational risk management plan ➢ The Outputs, Indicators and Means of Verification (+ activities, resource and costs) provide the framework for preparing project progress reports (to compare what was planned with what has been achieved)
Evaluation	➢ The Logframe provides a framework for evaluation, given that it clearly specifies what was to be achieved (namely results and purpose), how these achievements were to be verified (Indicators and Means of Verification) and what the key assumptions were.

	➢ The Logframe provides a structure for preparing TOR for Evaluation studies and for performance audits.

Elements of a Logical Framework Matrix (Logframe)

The matrix, which summarizes the final design of the project, usually comprises 16 frames organized under 4 major headings, as presented in Figure II-4.

Table II-2 Key Elements of the Logical Framework Matrix

First column	Second column	Third column	Fourth column
Project summary	**Indicators**	**Means of verification**	**Assumptions**
Overall goal			
Project purpose			
Outputs			
Activities	**Inputs**		
			Preconditions

Filing Information in Logical Framework Matrix

The general definitions of the items in the logframe and their means of application to loan projects are as described below.

The **Project Summary (first column)** provides information on the basic building blocks of the project and presents them as a cause-effect chain drawn from a preceding cause-effect analysis. The *inputs* are expected to be transformed into the *outputs* through the *activities*, which in turn are expected to achieve the *purpose of the project* (sometimes called the *immediate objectives* of the project) which contributes to the *overall goal* (sometimes called the *long term objectives* of the project.)

Overall goal: *The goal indicates the necessity of implementing the project, in terms of the goals and direction of development plans for the country and sector concerned (the plans which exist at the level above the project).* According to the vertical logic, the "overall goal" is attained through the achievement of the "project purpose" and the fulfillment of "assumptions". Therefore *the "overall goal" represents the long-term, indirect impact of the implementation of the project.* Normally the chosen overall goal is a goal that is expected to be reached a number of years after achievement of the project purpose[3].

Project purpose: This is *the objective that is expected to be attained as the direct result of the implementation of the project.* It is stated in the form of *positive changes for the target group (the main beneficiaries) or the target region.* From the vertical logic, if the "outputs" are attained and the "assumptions" stated on the same level are satisfied, the "project purpose" will be attained. The "project purpose" is an objective for the "**outcome**," which is an effect directly resulting from the output. Its achievement is the major deciding factor in determining whether or not the project has succeeded. The time the project is completed is taken as the deadline for attaining the "project purpose", but in the case of investment type projects, many projects attain their purposes some time after completion. Therefore if there is, for example, an irrigation project, rice production targets are set for a number of years after construction of the irrigation facilities is completed.

[3] Targets that will not be attained for decades after achievement of the project purpose and, conversely, targets that are attained simultaneously with the project purpose, are not desirable as overall goals. The former has too far to go between achievement of the project purpose and of the overall goal, often leading to excessively large unknown factors or vagueness in the direction of project implementation. The latter makes it difficult to state a direction in which the project should proceed in the long term.

At the project formation stage, the project purpose is the key anchor of the project design. This is the level of achievement that the project must deliver. This objective should become evident by the end (or a few years later) of the project implementation period. A project's scope and outputs will be designed around this objective to specifically ensure that it is achieved by the end of the project. It is therefore preferable to have only one immediate objective for the project. The **starting point** for preparing the logical framework must always be the immediate project objective or purpose. In other words, we must first identify the central problem (or opportunity) and the immediate desired impact as precisely as possible. We must also specify the verifiable performance targets that we expect the project to deliver by the time it is complete. These should normally be predictable. Thus, we begin with the "design summary" column, specifically the frame pertaining to the project purpose (i.e. the immediate objective). The related frames under the performance targets and the monitoring mechanisms are also completed in parallel. This is essential because the performance targets specify the immediate project objective and hence the expected immediate impact of the project. This must be done in tangible, measurable, and monitorable terms, ensuring that what the project wants to deliver.

Outputs: *"Outputs" are things that must be realized by the project if it is to achieve the "project purpose".* Normally multiple "outputs" are set. Within the vertical logic, if the "activities" are implemented and the "assumptions" on the level of the "activities" are satisfied, the "outputs" will be achieved. The basic distinction between "outputs" and "outcomes" is that the former refers to the goods and services that the implementation of the project is to create, and the latter refers to the changes that should occur in the beneficiaries as a result. In loan projects the "outputs" potentially fall within the following categories:

(a) *Infrastructure Outputs*: These are the typical physical deliverables of projects and can range from a road to an energy plant, from schools and curricula for children's education to a water supply system. They are usually physical deliverables necessary for achieving envisaged impacts.

(b) *Service-type Outputs*: These are outputs which may or may not accompany infrastructure support. They include services such as health care, agriculture extension programs, and research into new products or systems of operation.

(c) *Institutional Strengthening-type Outputs*: These types of outputs can range

from institutional diagnostic studies to the revision of operating strategies, the introduction of new operating systems, the upgrading of operating standards, the enhancement of staff skills, etc. Such strengthening is often necessary not just for the effective delivery of infrastructure and service outputs described above, but also for sustaining their functioning long after project completion.

Inputs/Activities: *"Inputs" are the resources (personnel, equipment and materials, land and facilities, operating funds etc.) used by the project to realize the "outputs".*

Inputs generally fall within four main categories:

- consultants to plan and support implementation— included in this are costs associated with required surveys, detailed design and technical advice;
- equipment and software plus related staff training;
- civil works; and
- local salaries and project management.

Further subcategories of inputs can be developed as required. In the logical framework coverage of costs is only provided in a summarized manner. Detailed cost tables are available separately.

"Activities" are specific actions taken by the executors to convert inputs into outputs. In loan projects, reference is made to the project implementation schedule listing up activities with lead to inputs. Detailed activity and implementation charts (GANTT charts or PERT/CPM drawings) should be available with project documentation. The most important purpose of the logical framework is to summarize the key elements of the project's design rather than present self-contained and comprehensive project information.

Indicators (Objectively verifiable indicators) / Means of verification: *"Indicators" are criteria for measuring the level of achievement of objectives and outputs,* and the *"means of verification" are data sources and data collection methods that state how the measured values of the indicators should be obtained and from whom (or from where).* For example, to measure the level of achievement of the "project purpose" of an irrigation project, indicators must be set in advance, such as an increase of rice production in the project area from XX tons before the project to YY tons after it. The stated means of verification can be a reference to agricultural statistics for the project area, sample surveys of farmers or other such methods. Setting appropriate indicators provides a

clear definition of what the objectives and outputs mean, as well as setting consistent criteria for checking (monitoring) whether the project is proceeding according to plan and judging (evaluating) whether it is a success. A detailed explanation of indicators can be found in Chapter V "Performance Indicators and the Operation and Effect Indicators".

Assumptions: *"Assumptions" are conditions necessary for the achievement of objectives (conditions for success), but they are also uncontrollable external factors because they are natural factors or outside the control of the project.* For example, for the construction of irrigation facilities (the output) to result in increased rice production (the project purpose), distribution channels must be established for obtaining proper seeds and fertilizers, and further work such as extension of farming methods will be required, but those are assumptions when they fall outside the scope of the project. Similarly, appropriate rainfalls, if required, are an assumption. The lowest level of the "assumptions" column is used to state **"preconditions"** which must be met before the project starts.

Considered in terms of vertical logic, "assumptions" in the four vertical levels are the necessary conditions needed to move from the lower levels to the state written on the top level. That also means that the "assumptions" can be clues for identifying, at the evaluation stage, the factors promoting or impeding the success of the project. For example, when the reasons why a project did not attain its purpose are considered, the actual performance in items lower than the "project purpose" in the logframe, namely "outputs", "activities" and "inputs", will be studied, but the "assumptions" will also have to be investigated to see whether they were actually satisfied.

Conditions for success, which can easily be confused with "assumptions", are points that should be strictly observed by the donor and the executing agency to ensure the smooth implementation of elements such as inputs and activities. These points are the project's "internal factors", i.e., the factors that can or should be controlled by the project. Among the "points of concern for project implementation and monitoring", internal factors are not recorded in the "assumptions" box of the logframe, even if they are conditions for success. However, internal factors that are thought to be extremely important for ex-post evaluation, perhaps as clues when searching for factors that promote or impede

the success of the project, can be recorded as footnotes outside the frame, where they can be useful in checking the situation.

Table II-3 Logframe: Definition of Each Term

Country/ Project name: Executing agency:
Project outline: Refer to "Project outline" from the staff appraisal report.

Project summary	Indicators		Means of verification	Assumptions
	Indicator	Planned values		
Overall goal The goals and direction of development plans for the borrower country and the target sector, and the necessity of the project are stated. ✓ Refer to "Project background and necessity", "Project objectives" and "Project effects" in the staff appraisal report.	Criteria to measure achievement of the overall goal ✓ Refer to "Project background and necessity" and "Project effects" in the staff appraisal report.		Data sources and data collection methods to obtain indicators for the overall goal. ✓ Executing agency documents ✓ Statistical documents from the governments of the target country and region ✓ Interviews and questionnaire surveys with beneficiaries	Conditions which are important for achievement of the objectives but which cannot be controlled by the project ✓ External factors out of "Points of concern for project implementation and monitoring" in the staff appraisal report ✓ Other factors found through "vertical logic" of the logframe
Project purpose The objective that is expected to be attained as the direct effect of the implementation of the project (positive changes for the target group or the target region). ✓ Refer to "Project objectives" in the staff appraisal report.	Criteria to measure achievement of the project purpose ✓ Refer to "Project effects" in the staff appraisal report. ✓ As far as possible, record target values. ✓ Record planned value of IRR as an indicator to measure cost-benefit rate.		Data sources and data collection methods to obtain indicators for the project purpose. ✓ Executing agency monitoring documents ✓ Interviews and questionnaire surveys with beneficiaries ✓ Documents from local authorities and other related agencies	(Assumptions necessary from the project purpose to overall goal)
Outputs Things which must certainly be achieved to attain the project purpose ✓ Refer to "Project plan summary" in the staff appraisal report.	Criteria to measure achievement of each output ✓ Refer to "Project plan summary" in the staff appraisal report.		Data sources and data collection methods to obtain indicators for each output ✓ The PCR (Project Completion Report) ✓ Progress reports ✓ The completion report compiled by the consultants	(Assumptions necessary from the outputs to project purpose)
Activities Actions required to achieve outputs ✓ Refer to "Project plan summary" and " Project implementation schedule" in the staff appraisal report.	**Inputs** Resources used in carrying out the activities ✓ Refer to project cost and budgetary appropriation in the staff appraisal report.			(Assumptions necessary from the activities to outputs) **Preconditions** Conditions which must be met before inputs can be provided and activities can begin

Table II-4 Sample Logframe (1)

Country Name：Thailand
Project Name : Krung Thep Bridge Construction Project（TXVII-3）
Executing Agency : Public Works Department, Ministry of Interior (PWD)

To increase the traffic capacity across the river by constructing a new Krung Thep Bridge (concrete fixed bridge) upstream in parallel to the existing Krung Thep Bridge (bascule bridge), which will also be rehabilitated for efficient utilization as a bridge exclusively for light vehicles.

Project Summary	Indicator and Target Value		Means of Verification	Assumptions
	Indicator	Target Value		
Overall Goal Alleviation of traffic congestion in the street of Bangkok [1]	Decreases in peak time traffic volume and average daily traffic volume as well as an increase in average vehicle speed during peak hours in trunk roads linked or close to this project.	Not Available.（Check JICA survey.）	Interviews with PWD or road users/local residents.	
Project Purpose Greater efficiency in the river-crossing traffic via the old and new Krung Thep Bridges.	1) An increase in average daily traffic volume 2) An increase in peak time traffic volume 3) Time saved in crossing the river during peak hours. 4) EIRR (time and fuel saved)	1) 79,845 PCU/day（1988）, 99,734 PCU/day（1991）、Target value not available (check JICA survey or Thai D/D) 2) 4,439 PCU/hr（recorded in 1991）, 7,300 PCU/hr（JICA forecast for 2001）, 8,900P CU/hr（JICA forecast for 2010） 3) Not available（Check JICA survey） 4) 20.1%	1)2) PWD 3) Interviews with PWD or road users 4) Recalculation using actual data.	（Assumptions that lead project purpose to overall goal） ・Other uncompleted sections of the central ring road are completed. ・Trunk roads linked or close to this project are developed in an appropriate manner.
Outputs 1) Rehabilitation of the existing Krung Thep Bridge 2) Construction of the new Krung Thep Bridge	1) The existing Krung Thep Bridge to be rehabilitated 2) The new Krung Thep Bridge to be constructed	1) Rehabilitation of the bridge to be exclusively used by light-vehicles. 2) A concrete fixed bridge; a center span: 225m, side spans: 125m each, and 6 lanes	PCR, site observation	（Assumptions that lead outputs to project purpose.） ・The old bridge is efficiently and exclusively used by light vehicles. ・Traffic is effectively controlled.
Activities Consultant contract 1992.8 Land acquisition 1992.9–1994.8 Construction bidding & contract closing 1993.1 - 1993.12 Construction of a new bridge 1994.1–1996.6 Rehabilitation of the existing bridge 1996.7 – 1996.12	Inputs（at the time of appraisal） Total project cost: ¥15,091 mil. ODA loan portion: ¥7,546 mil. Civil works: Foreign Currency ¥2,250 mil. / Domestic Currency ¥6,126 mil. Land acquisition: — / ¥3,149 mil. Tax: — / ¥255 mil Price escalation: ¥250 mil / ¥913 mil Contingency: — / ¥902 mil Consulting services□[2] / ¥795 mil ¥451 mil □ Bidding assistance, construction management and training on traffic control on the old bridge.			(Assumptions that lead activities to outputs.） Preconditions Resettlement of 183 households and land acquisition were carried out as planned.

Table II-4 Sample Logframe (2)

Project Name: Regional Development Program | Duration: Sep 1993 - Sep 1998 | Date: [August 5, 2005]

Project Area: 3 Regions; North, North-east and South | Target Group: Tourism Industry | Ver. No.: Version 1.0

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal The overall goal of the project is to develop rural area, to distribute income, to earn foreign currency, and to create employment through tourism industry's development	- Income of project areas (GPP) - Foreign exchange earnings - Employment opportunities	- National statistic Office report - Bank of Thailand report - NESDB report - Office of Tourism Development report	
Project Purpose Additional tourism demand (increase of visitors) will be created by upgrading tourism infrastructure and adding tourist attractions	[Operation] - No. of tourist arrival (Int'l and Domestic) - (Utilization of facilities) [Effect] - New job creation within tourism industry sector - Tourist expenditure (Int'l visitors, domestic tourists) - Increase in hotel rooms - EIRR	- National statistic Office report - Bank of Thailand report - NESDB report - Office of Tourism Development report	- Community acknowledgement/ acceptance of the tourist site improvement area - Appropriate O&M of developed facilities
Outputs 28 Sub-projects of tourism infrastructure and attraction improvement - North 13 (CM 10,CR 3) - Upper N/E 1 (UD 1) - Lower N/E 5 (UB 5) - South 9 (PK 5, PN2, KB1, SK1)	Completed Sub-projects	- PCR	- No major change in project scope - Tourism Industry would respond and make investment in hotel and restaurant - Marketing Campaign; tourist site promotion, would be done successfully by TAT - No major natural/human disasters
Activities - Construction/Improvement of infrastructure and other facilities -Project Coordination and management (PMU/Consultant) - Completion of Construction: schedule 1997	**Inputs** - Project Cost JY 2,045 mil and B 916 MIL (=JY 6,097 mil) (Financing OECF JY4,268 mil and RTG B414 mil)		- Effective coordination with implementing agencies of sub-projects - RTG's timely allocation of budget **Pre-conditions** - Cabinet approved this project - Obtain loan from OECF

3. Integrating Ex-ante Evaluation into LP-MIS

Loan Portfolio Management Information System (LP-MIS) is a web-based information database system developed by PDMO having functions of project monitoring and evaluation, and loan portfolio management.

The intended user groups and their purposes in using LP-MIS are as follows;[4]

Intended User Group	Purpose
➢ PDMO	➢ To monitor and evaluate the progress of project implementation and loan utilization as part of their management of loan portfolio
➢ Project Implementing Agencies (PIAs)	➢ To report, as required by PDMO, the progress of their projects as well as problems and issues relevant to project implementation
➢ General Public	➢ Depend on their interest

Outline of LP-MIS[5]

Design Feature	A web-based MIS that monitors and evaluates the progress of project implementation and loan utilization
Input Data	From the project implementing agencies the lending agencies
Outputs	Information on project and loan at appraisal Latest available data on project progress and loan utilization Evaluation of project and loan progress measured in terms of : - Project Progress Index (PPI) - Disbursement Progress Index (DPI) - Loan Adequacy Index (LAI) - Summary report on each loan (access is limited to only OSU staff)

Frequency of data input: Once a month

[4] LP-MIS User Manual, OSU, PDMO, 200?
[5] http://svpdmo.pdmo.mof.go.th/osu/about.php_3

Input Information

a) Project Information

- Project Title; Project Type; Development Focus;
- Expected Project Completion Date;
- Project Director; Contact Address
- Project Objectives; Project Scope; Project Cost Estimates (at Appraisal);
- Project Risks; Land Acquisition; Counterpart Budget; Project Environmental Issues
- Project Cost Estimate (current; by category)
- Loan Covenants

b) Loan Information

- Loan No.; Loan Title; Project; Loan Type; Lender
- Currency; Interest Rate; Commitment Charge Rate; Repayment Period; Grace Period; Service Charge Rate; Counterpart Budget
- Fact Finding Dates; Appraisal Dates; Board Approval Date; Loan Negotiations Dates; Cabinet Approval Date; Cabinet Loan Signing Approval Date; Loan Signing Date; Legal Opinion Date; Loan Effective Date
- Original Loan Closing Date; Current Loan Closing Date
- Original Loan Amount; Cancellation; Loan Allocation; Category; Allocated Amount; % Expenditures to be Financed
- Commitment Amount; Commit. Date; Commit. Amount (USD Eqv.); Commit. Amount (currency in contracts); Disbursement Amount; Disb. Date; Disb. Amount (USD Eqv.); Disb Amount (actual amount in the paid currency)

c) Disbursement Projection

d) Contract Information

- Contract No.; Financed under Loan-key in the loan number; Work Component-cost category of the contract;
- Estimated Cost-the estimated contract value in USD;
- Contract Award-date of contract award; Begin-date when the contract is effective; Completion-date when the contract is required to be completed; Days-the contract implementation period in days;
- Contract Details-status of progress of the contract to be key in quarterly during the contract period.

- Milestones in the procurement process
- % Completion-if the procurement has been completed, key in the physical progress of the contract in % of the total contract works. For consulting service and training contracts, if there is no estimate of contract progress, estimate the contract progress from the percentage of time lapsed

Inter-Organizational Arrangement for LP-MIS

The Project Data necessary to conduct monitoring and evaluation must be provided by the Executing Agency to PDMO. Together with Logframe of the Project, and appropriate project reports, the PDMO may use the form shown in Table II-6 LP-MIS Entry Data from the Executing Agency. This becomes basic information for monitoring and evaluation for the future. PDMO also must agree with the Executing Agency, at the commencement of the project, for regular and timely submission of project progress report, and other report such as project completion report, ex-post monitoring reports.

Checking Evaluability

The PDMO staff in charge of project approval should ensure that each new project will be able to benefit from future evaluation processes. Evaluability[6] is a review undertaken by the project team to assess the extent to which the design described in project documents is able to support monitoring and evaluation activities. An evaluability assessment will:

- support the design team in ensuring the project is of the highest quality,
- ensure that logical framework standards are being adhered to, and
- ensure that the project plan provides adequate criteria for monitoring and evaluation.

Table II-5 Evaluability Checklist

A. Diagnosis
➢ The problem or need that the project attempts to address is clearly identified through consultation with stakeholders (executing agencies, beneficiaries, other interested parties)
➢ The causes of the problem are identified.

[6] It may be defined as the extent to which the value generated or expected results of a project are verifiable in a reliable and credible manner.

- The potential beneficiaries are clearly identified

B. Definition of Objectives

- Expected results at end of project execution are clearly linked to the problems and needs identified in the diagnosis.

C. Project Logic

- Project objectives (goal, purpose) are clearly stated.
- Goods or services that the project will generate have been identified and described.
- All Components contribute to the achievement of the purpose.
- All Components include necessary actions to attain the purpose.
- All project elements are logically related.

D. Assumptions (and Risks)

- Enabling conditions for project execution and achievement of project objectives are identified.
- Individuals, groups, institutions, and organizations that could positively or negatively affect the execution of the project have been identified.
- Events or elements that are outside the direct control of project management and that could affect project viability, outputs and objectives have been identified and described.
- Follow-up actions to monitor validity of assumptions are identified.

E. Output indicators

- The output indicator (s) for purpose and components identify quantitative or qualitative measure(s) of the expected goods and services to be delivered through project execution
- Output indicators clearly specify expected target levels during and at the end of project.
- Baseline data on the conditions prior to the execution of the project have been included. If no baseline data provided, project design includes data collection.
- Benchmarks, target figures, or other evidence to monitor progress and determine attainment of the objectives have been provided.
-

Table II-6 LP-MIS Entry Data

Prepared by (OIC)	:
Approved by (Director)	:
Checked by (OSU)	:

PROJECT INFORMATION	DATA ENTRY	GUIDELINES
Project title (1)		
Implementing agency (2)		
Project Director (3)		
PD's telephone (4)		
PD's e-mail (5)		
Overall Goal (6)		The overall goal represents the long-term, indirect effect/impact to the country and sector concerned of the implementaion of the project.
Goal Indicators (7)	Indicator / Target / Data source	Criteria for measuring the level of achievement of overall goal. Sometimes, quantitative indicators may not be available for oveall goal.
Project Purpose (8)		Project purpose is the objective that is expected to be attained as the direct results of the implementation of the project, stated as positive changes for the target group (the main beneficiaries) or the target region. In some cases one project has multi-purposes (more than one objetive).
Purpose Indicators (9)	Indicator / Target / Data source	There are two kinds; operational and effect indicators. Operation indicators: To measure, quantitatively, the operational status of project. Effect indicator: To measure, quantitatively, the effects generated by project. IRR is one of effect indicators.

Outputs (10)

Outputs are goods/services created through project activities. Examples are; infrastructure facilities, equipment,trained people, institutional structure, study reports, etc.

Output Indicators (11)

Indicator	Target	Data source

Data source is most oftenly PCR.

Activities (12)

Activities are specific actions taken by the implementing agency and others to convert inputs into outputs. Reference may be made to project implementation schedule.

Inputs (13)

Inputs are the resources (financial, personel, equipment and materials, land and facilities, etc.) used by the project to realize the outputs. For investment projects, project costs and financing sources are stated.

Assumptions

External (14)

Internal (15)

Preconditions (16)

Assumptions are conditions necessary for the achievement of goal, purpose, output, etc.
There are uncontrolable external factors which fall outside the scope of project, and
internally controlable (but most critical) factors.
Preconditions are the critical factors to be met before the project starts.

LOAN INFORMATION

Loan title
Lending agency
Loan No.
Key dates
Loan signing date
Loan effective date
Loan closing date (orig)

Loan amount million
Loan currency

Loan allocation	Category name	Amount
Loan category (i)		
Loan category (ii)		
Loan category (iii)		
Loan category (iv)		
Loan category (v)		

Disbursement schedule	Amount
20xx	
20xx	
20xx	
20xx	
20xx	
20xx	

Table II-6(2) LP-MIS Entry Data (2)

Project Implementation Plan (to be prepared prior to commencement of the Project)

I. Project No. MGP-1-1 — Given by OSU [MGP-(Sector)-(Project)]

II. Project Title — To be filled by OSU

III. Project Implementing Agency

IV. Project Outline — The Project aims *to accommodate* ... [outcome of project]...., by *constructing* ....[output of project] ...., thereby *to create new job* ...[goal of project]..... — Maxmim 80 words, including major scope/specification of the Project

V. Project Performance Indicators — To be discussed and agreed between PDMO and PIA

	Indicator	Unit	Baseline		Target	
			Value	Year	Value	Year
1						
2						
3						

VI. Commencement of Service — If the Project facilities commence operations part by part, indicate major ones.

		Month/Year
1	[Partial Service Phase I]	
2	Full Scale Service	

VII. Key Milestones and Critical Risks — Select most significant milestones, and put them. Maximum number is ten (10) milestones. If there are any factors (risks) which could affect attaining milestone, put them at risk column.

	Milestone	Month/Year	Critical Risks
1			
2			
3			
4			
5	Commencement Full Service		

VIII. Allocated Budget and Financing (Million Bagt) — If number of procurement items are more than eight (8), select eight biggest ones and input data for ecah item, and all the others are put into [9. All the others]. Consulting Service should be included in the first eight (8).

	Procurement Item	Allocated Budget	Financing			
			Government	Self Finance	Loan (dom.)	Loan (for.)
1						
2						
3						
4						
5						
6						
7						
8						
9	All the others					
10	Contingency					
	TOTAL					

IX. Procurement Schedule

	Procurement Item	Target Date (Month/Year)		
		Contract	Work start	Completion
1				
2				
3				
4				
5				
6				
7				
8				
9	All the others			

Procurement items should be same as the above.

X. Implementation Schedule

Please attach a bar chart (Gantt Chart) , showing start-end of each activity/task, for the entire implementation period.

XI. Disbursement Schedule (by Procurement Item) (Million Baht)

	Procurement Item	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Total
1								
2								
3								
4								
5								
6								
7								
8								
9	All the others							
	Total							

Procurement items must be same as the above. "Disburse" means to withdraw money from the financier's account, not being counted at payment made to the contractor.

XII. Disbursement Schedule (by Finance Source) (Million Baht)

	Finance Source	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Total
1	Government							
2	Self Finance							
3	Loan (Domestic)							
4	Loan (Foreign)							
	Total							

Contingencies are EXCLUDED from this table.

XIII. Disbursement Schedule (First Fiscal Year)

(Million Baht)

	Procurement Item	Oct	Nov	Dec	Jan	Feb	Mar
1							
2							
3							
4							
5							
6							
7							
8							
9	All the others						
	Total						

For the first fiscal year only.

(Million Baht)

	Procurement Item	Apr	May	Jun	Jul	Aug	Sep	Total
1								
2								
3								
4								
5								
6								
7								
8								
9	All the others							
	Total							

At Project Implementing Agency

Project Director (PD) of PIA	
PD's Telephone	
PD's E-mail	

At OSU/PDMO

Data prepared by	
Data approved by	
Data input by	

Date of Input	

III. MONITORING OF ON-GOING PROJECT

1. Objectives of PDMO's Monitoring of On-going Projects

It is sometimes true that staff of PDMO have to deal with ten times more information than they need for understanding the progress of a project while they still lack the critical information they would need for proper reporting. Effective monitoring is a tool to reverse this.

Monitoring is a procedure for checking the effectiveness and efficiency of implementing a project by identifying strengths and shortcomings and recommending corrective measures to realize and optimize the intended outcomes.

The benefits of monitoring are that monitoring:

- establishes whether project is carried out according to plan;
- continually reviews the project assumptions thereby assessing the risk;
- establishes the likelihood of output achievement as planned;
- verifies that outputs continue to support the purpose;
- identifies recurrent problems that need attention;
- recommends changes to the project implementation plan; and
- helps identify solutions to problems.

2. Monitoring Steps of Implementation Progress

The monitoring role of the PDMO in coordination with the Executing Agency is to improved project performance. The five steps for successful monitoring, outlined below, help ensure effective and successful project monitoring.

- Project Familiarization
- Determine Information Requirements and Information Needs of PDMO
- Establish a Management Information System
- Report to Relevant Organizations within the Government
- Intervene to Improve Project Performance

Step1: Project Familiarization

The officer-in-charge of PLOB needs to understand its context and history or the projects he/she handles. To do so, the monitor must:

- review project documents, including the logframe, and available reports;

- conduct interviews with the project design and project management teams/professionals;
- visit the project site and interview executing agency personnel.

Step 2: Determine the Information Requirements and Information Needs of PDMO

It is important that the right information be provided to the right people at the right time in order to ensure that monitoring assists in enhancing project performance. The project monitors must:

- clarify, with the Executing Agency's Project Management Team, who should regularly contacted for monitoring; and
- ascertain, with the counterpart project manager, whether the monitoring stakeholders have particular issues or concerns that should be incorporated, in addition to standard monitoring items.

Step 3: Establish a Management Information System (MIS)

The monitoring information needs should be used to develop a management information system (MIS) for the project by the Project Implementation Unit of the Executing Agency. The MIS developed by the Executing Agency should at least cover the requirement of PDMO's monitoring. This process will be simplified once a logframe has been developed for the project. In order for an MIS to be effective, the information collected must:

- be pertinent, in that it is the appropriate information;
- be timely, in that it arrives when you need it;
- be cost effective to collect;
- answer strategic questions; and
- streamline monitoring, evaluation, and special reporting activities.

The required steps for putting together an MIS plan by the Executing Agency are:

- identify information users;
- clarify users needs;
- identify priority areas of information;
- link information needs and sources (ie. determine which ongoing and existing data can be used and what needs to be generated);
- determine appropriate methods for meeting information needs (ie. establish data collection methods);

- identify roles and responsibilities;
- identify reporting requirements and formats;
- identify resources (human, financial, technological) required to make the system reliable and credible; and
- establish feedback procedures.

Step 4: Reporting

Many of the reporting procedures already exist, and good monitors know that the earlier they can identify and communicate issues (even informally), the easier the issues may be to resolve. However, the checklist below may be useful.

In general, data collected for monitoring must answer the following questions:

- Are the outputs or components (eg. goods, services, technical cooperation, training and policy conditions/measures) being achieved as planned, in terms of quality, schedule and cost?
- Are inputs (eg. disbursements, counterpart funds, project management, project implementation staff, goods and services, etc.) being delivered/provided in a timely and cost-effective manner?
- To what extent are the project assumptions, as identified in the logframe, still valid? Have certain assumptions become risks that may hinder the project's performance or progress?
- To what extent will the project likely achieve its development objectives?

Although the format may change over time, the progress report is designed to track the status of inputs/outputs, assumptions/risks, and the likelihood of the achievement of development objectives. Regardless of the format, it is important that the information be:

- timely;
- as brief as possible and convey the information essential to its users;
- of an adequate technical quality in terms of content, presentation, credibility, action-orientation.

Step 5: Intervening to Improve Project Performance

Monitors are not merely passive collectors and communicators of information. Effective evaluation monitors need to be available to support project management in many formal and informal ways. Both in their regular and their special work, monitors need to turn their findings into appropriate action.

3. Content of Monitoring

The content of the progress monitoring includes

(a) Introduction and Basic Data

- Project title, executing agency(ies), implementing agency(ies);
- Total estimated project cost and financing plan;
- Dates of approval, signing of loans, and loan closing, etc;

(b) Utilization of Funds

- Cumulative contract awards financed by the loans, and counterpart funds
- Cumulative disbursements from the loans, and counterpart funds (expenditure to date), and comparison with time-bound projections (targets)
- Re-estimated costs to completion

(c) Project Purpose

- Status of project scope/implementation arrangements compared with those in the plan
- An assessment of the likelihood that the immediate development objectives (project purpose) will be met in part or in full, and whether remedial measures are required based on the current project scope and implementation arrangements;
- An assessment of changes to the key assumptions and risks that affect attainment of the development objectives; and
- Other project developments, including monitoring and reporting on environmental and social requirements that might adversely affect the project's viability or accomplishment of immediate objectives.

(d) Implementation Progress

- assessment of project implementation arrangements such as establishment, staffing, and funding of the Project Implementation Unit;
- assessment of the progress of each project component, such as,
  - recruitment of consultants and their performance;
  - procurement of goods and works (from preparation of detailed designs and bidding documents to contract awards); and
  - the performance of suppliers, manufacturers, and contractors for goods and works contracts;
- Assessment of progress in implementing the overall project to date in comparison with the original implementation schedule target, (include simple charts such as bar or milestone to illustrate progress, a chart showing actual

versus planned expenditure, S-curve graph showing the relationship between physical and financial performance, and actual progress in comparison with the original schedules and budgets); and

- An assessment of the validity of key assumptions and risks in achieving the quantifiable implementation targets.

(e) Major Project Issues and Problems

Summarize the major problems and issues affecting or likely to affect implementation progress, compliance with covenants, and achievement of immediate development objectives. Recommend actions to overcome these problems and issues (e.g., changes in scope, changes in implementation arrangements, and reallocation of loan proceeds).

4. Performance Management and Reporting

Effective performance management requires the on-going monitoring of the progress of a project towards the achievement of specified objectives. In performance management, it measures what the project has achieved, not simply what has been completed. To effectively manage project performance, the manager requires indicators that are simple to understand, easy to measure, and for which information can be collected and processed in a timely manner. Management needs an efficient and effective management information system (MIS) that works as an early warning system for potential problems. At the same time, the system should also measure the level of achievement of the project at input, output, purpose, and goal levels.

Sample Monitoring Report Template developed by JBIC is attached in the following pages.

5. Management Information Systems

The essential elements of an efficient and effective MIS are as follows:

- Information requirement for managing projects is better to be incorporated into the existing system of an executing or implementing agency.
- Information collected must indeed measure the level of achievement at the input, output, purpose and goal levels.
- The information must be accurate, timely, and cost effective.
- Management must be able to easily interpret information for use in decision-making.

Monitoring is concerned with both the efficiency and effectiveness of project implementation. Specifically, it is concerned with assessing how efficiently inputs are translated into outputs. This form of input-output monitoring focuses on the availability of project resources and the use of these to achieve outputs. The transition from outputs to purpose is often referred to as effectiveness, that is, the ability of the resources and outputs to achieve the purpose of the project. This level of monitoring is even more critical since the value of the project investment is in achieving the project impacts.

The MIS for the project must provide an early warning system to project management about potential problems. It may also suggest possible ways to improve the overall project. The executing agencies are usually most interested in the indicators reflecting the use of inputs, and the achievement of outputs. Planning agencies and donors, while also interested in these verifiable performance indicators, are probably more interested in the verifiable performance indicators at the output, purpose and goal levels. PDMO may be interested in all indicators. While it is of vital importance to monitor the verifiable performance indicators closely at each level of the cause-effect hierarchy, it is equally important to monitor the risks/assumptions of the project environment. Therefore, the project's MIS must also provide for monitoring and reporting on these external variables.

6. Organizational Relations for Monitoring

The Project Implementation Unit of the Executing Agency is responsible for ongoing monitoring and has the prime responsibility to identify performance problems and work towards their successful resolution. Effective monitoring enables both the PDMO and the Executing Agency to act before the problems get too far advanced for effective solution.

The Executing Agency shall provide the data of progress of a project to PDMO as follows;

- Monthly Disbursement Progress
- Quarterly Project Implementation Progress
- Annual Disbursement Program

After receiving these reports from Executing Agency, the officer in charge of the

project in PLOB reviews the appropriateness of the submitted data, and forwards the data to OSU staff to process the data into LP-MIS.

Table III-1 Quarterly Progress Report Format

Quarterly Progress Report (to be submitted to OSU/PDMO within 15 days from quarter end)

I. Reporting Quarter (Month/Year) From _____ To _____

II. Project No. MGP-1-1

III. Project Title _____

IV. Progress of the Project _____

Narrative summary of the Project: current status, progress in the last three months, including resources used, activities, and produced outputs. Maximum 150 words.

V. Problems (including potential problems which may arise in the future)

Explanation of Problem	Action taken/to be taken	Deadline

VI. Implementation Schedule

Please attach a revised bar chart (Gantt Chart) based on current circumstances, showing start-end of each activity/task, for the entire implementation period.

VII. Completion of the Project

Original plan (mm/yyyy)	
Current estimate (mm/yyyy)	

VIII. Original/Revised Procurement Schedule

	Procurement Item	Original Date (Month/Year)			**Actual**/*Estimate* Date (Month/Year)		
		Contract	Work start	Completion	Contract	Work start	Completion
1							
2							
3							
4							
5							
6							
7							
8							
9	All the others						

In the right side table (Actual/Estimate), please show **the date in bold character** for finished task, and *the date in italic* for incompleted task.

IX. Revised Disbursement Schedule (by Procurement Item) (Million Baht)

	Procurement Item	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Total
1								
2								
3								
4								
5								
6								
7								
8								
9	All the others							
	Total							

Procurement items must be same as the above.

X. Revised Disbursement Schedule (by Finance Source) (Million Baht)

	Finance Source	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	Total
1	Government							
2	Self Finance							
3	Loan (Domestic)							
4	Loan (Foreign)							
	Total							

Contingencies are EXCLUDED from this table.

At Project Implementing Agency

Project Director (PD) of PIA	
PD's Telephone	
PD's E-mail	

At OSU/PDMO

Data prepared by	
Data approved by	
Data input by	

Date of Input	

Table III-2 Monthly Disbursement Progress Report Format

Monthly Progress Report: Disbursement (to be submitted to OSU/PDMO by 10th day of next month)

I. Reporting Month (Month/Year)

II. Project No. MGP-1-1

III. Project Title

IV. Disbursement Schedule (Current Fiscal Year) (Million Baht)

	Procurement Item	Oct	Nov	Dec	Jan	Feb	Mar
1							
2							
3							
4							
5							
6							
7							
8							
9	All the others						
	Total						

Legend

Bold	Disbursed
Italic	Planned

(Million Baht)

	Procurement Item	Apr	May	Jun	Jul	Aug	Sep	Total for twelve Mnth	Disbursed This Year	Cumulative Upto PrevYr	Cumulative Up to Now
1											
2											
3											
4											
5											
6											
7											
8											
9	All the others										
	Total										

At Project Implementing Agency

Project Director (PD) of PIA	
PD's Telephone	
PD's E-mail	

At OSU/PDMO

Data prepared by	
Data approved by	
Data input by	

Date of Input	

Table III-3 Annual Disbursement Plan Format

Annual Disbursement Plan (to be submitted to OSU/PDMO by July 15th, and again by October 15th)

I. Planning Year (20XX/YY)

II. Project No. MGP-1-1

III. Project Title

IV. Disbursement Plan (For Next Fiscal Year) (Million Baht)

	Procurement Item	Oct	Nov	Dec	Jan	Feb	Mar
1							
2							
3							
4							
5							
6							
7							
8							
9	All the others						
	Total						

(Million Baht)

	Procurement Item	Apr	May	Jun	Jul	Aug	Sep	Total for Next Year	Cumulative End This Yr	Cumulative End Next Yr
1										
2										
3										
4										
5										
6										
7										
8										
9	All the others									
	Total									

At Project Implementing Agency

Project Director (PD) of PIA	
PD's Telephone	
PD's E-mail	

At OSU/PDMO

Data prepared by	
Data approved by	
Data input by	

Date of Input	

Project Status Report
on
Project Name
Loan Agreement No 00-P000

Organization Information

Borrower	_____ Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	_____ Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____
Guarantor	_____ Person in Charge _____ (Division) _____ Contacts Address: _____ Phone/FAX: _____ Email: _____

Outline of Loan Agreement:

Source of Finance	JBIC: Not exceeding ¥ _____mil. Government of (_____): _____
Terms and Conditions	For JBIC -Interest Rate: _____% p.a.(other than consulting services) _____% p.a.(consulting services) -Repayment Period: _____years, including __years of grace period (other than consulting services) _____years, including __years of grace period (consulting services) -Tying Status _____

1: Project Description (Relevance)

1-1 Project Objective

Original:(*P/M*)
Modified objective and its reason(s):(*P/R and PCR*)

1-2 Necessity and Priority of the Project

- Consistency with development policy, sector plan, national/regional development plans and demand of target group and the recipient country.

Original: (*P/M)* **Attachment(s):**
Actual: *(P/R,PCR)* **Attachment(s):required only when they are revised.**

1-3 Rationale of the Project Design

- Timing, scale, technology of the project

Original: *(P/M)*
Actual: (*P/R,PCR)*

2: Project Implementation (Efficiency)

2-1 Project Scope

Table 2-1-1a: Comparison of Original and Actual Location

Location	**Original:** *(P/M)* **Attachment(s):Map**	**Actual:** *(P/Rand PCR)* **Attachment(s):Map**

Table 2-1-1b: Comparison of Original and Actual Scope

Items	Original	Actual
(P/M)	*(P/M)*	*(P/R and PCR)*

2-1-2 Reason(s) for the modification if there have been any.

(P/R and PCR)

2-2 Implementation Schedule

Table 2-2-1: Comparison of Original and Actual Schedule

Items	Original	Actual
【*P/M*】 Project Completion Date*	*(P/M)*	*(P/R,PCR)* As of (Date of Revision) Please state not only the most updated schedule but also other past revisions chronologically.

*Project Completion was defined as _____ at the time of L/A.

2-2-2 Reasons for any changes of the schedule, and their effects on the project.

(P/R and PCR)

2-3 Project Cost

2-3-1

Table 2-3-1a: Comparison of Original and Actual Cost BY ITEM

Unit: ( )

Breakdown of Cost	Original								
	Foreign Currency Portion			Local Currency Portion			Total		
	Total	JBIC Portion	Others	Total	JBIC Portion	Others	Total	JBIC Portion	Others
Item	( )	( )	( )	( )	( )	( )	( )	( )	( )
(P/M)	*(P/M)*	*(P/M)*	*(P/M)*	*(P/M)*	*(P/M)*	*(P/M)*	*(P/M)*	*(P/M)*	*(P/M)*
Total									

(Note) Exchange Rate: US$1=LC =¥ (LC1=¥)

Base Year for Cost Estimation:

Unit: ( )

Breakdown of Cost	Actual								
	Foreign Currency Portion			Local Currency Portion			Total		
	Total	JBIC Portion	Others	Total(	JBIC Portion	Others	Total	JBIC Portion	Others
Item	( )	( )	( )	( )	( )	( )	( )	( )	( )
(P/R,PCR)									
Total									

(Note) Exchange Rate: US$1=LC =¥ (LC1=¥)

Base Year for Cost Estimation:

Table 2-3-1b: Comparison of Original and Actual Cost BY YEAR

*Fiscal Year starting in _____ and ending in _____ Unit: ( )

Breakdown of Cost	Original			Actual		
	JBIC Portion	Others	Total	JBIC Portion	Others	Total
Year	( )	( )	( )	( )	( )	( )
(P/M)	*(P/M)*	*(P/M)*	*(P/M)*	*(P/R,PCR)*	*(P/R,PCR)*	*(P/R,PCR)*
Total						

Note: Exchange Rate used: _____
You can use any currencies in this chart, i.e. you may use your local currency as well as Yen for each figure.
If there were the portion of the financial resources such as of World Bank, ADB and so forth, other than your own budget, please fill in another column between "JBIC Portion" and "Others" and fill in the figures of them

2-3-2 Reason(s) for the wide gap between the original and actual, if there have been any, the remedies you have taken, and their results.

(P/R, PCR)

2-4 Organizations for Implementation

2-4-1 Executing Agency:

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

Original: *(P/M)*

Actual, if changed: *(P/R and PCR)*

2-4-2 Contractor(s)/ Supplier(s), and Consultant(s) and Their Performance:

2-4-2-1 Procurement and Consultant

Table 2-4-2: Procurement of Contractor(s)/Supplier(s) and Consultant(s)

Contract Package	Selection Method	
	Original: *(P/M)*	**Actual:** *(P/R and PCR)*
Contractor(s)		
Supplier(s)		
Consultant(s)		

2-4-2-2 Performance

(P/R and PCR) **Information on the Contractor(s)/ Supplier(s):** **Evaluation:**
Information on the Consultant(s): **Evaluation:**

2-5 Precautions (Measures To Be Adopted/Points Which Require Special Attention)

- Risks and issues, if any, which may affect the project implementation and planned countermeasures to be adapted, in terms of physical, environmental or social aspects.(e.g., land acquisition, resettlement , HIV awareness and prevention program, gender consideration and EIA clearance)
- Environmental Checklist or report of monitoring indicator (if applicable)

Original issues and Countermeasure(s)	Actual issues and Countermeasure(s)
(P/M)	*(P/R and PCR)*

2-6 Photographs of Output of the project (P/R and PCR):Attachment

3: Benefit Derived from the Project (Effectiveness)

3-1 Operational and physical condition of each facility developed/supplied by the project.

Facilities	Description of condition	Problems, its Background and Remedial Action Plan
(P/R and PCR)	*(P/R and PCR)*	*(P/R and PCR)*

3-2 Precautions (Measures To Be Adopted/Points Which Require Special Attention)

- Risks and issues, if any, which may affect the project outcome and planned countermeasures to be adapted, in terms of physical, environmental or social aspects.
- Environmental Checklist or report of monitoring indicator (if applicable)

Original issues and Countermeasure(s)	Actual issues and Countermeasure(s)
(P/M)	*(P/R and PCR)*

3-3 Environmental and Social Impacts

- Major environmental and social impacts have occurred during project implementation (e.g. involuntary resettlement, poverty reduction, natural environment)

Issue(s)	Action or countermeasure(s) taken and remaining problem(s)
(PCR)	*(PCR)*

3-4 Qualitative and Quantitative Data of Monitoring Indicators

・Operation and Effect Indicator, EIRR and/or FIRR
・Supporting data for computing EIRR and/or FIRR.

Indicators	Original (Yr)	Present (Yr)	Target (Yr)
(P/M)	*(P/M)*	*(P/M,PCR)*	*(P/M)*

3-6 Monitoring Plan for the indicators

- Monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term and so forth.

Original:*(P/M and PCR)*
Actual:*(P/R and PCR)*

3-7 Achievement of the Project Objective

(PCR)

4: Operation and Maintenance (O&M) (Sustainability)

4-1 O&M and Management

- Organization chart of O&M
- Operational and maintenance system (structure and the number ,qualification and skill of staff or other conditions necessary to maintain the outputs and benefits of the project soundly, such as manuals, facilities and equipment for maintenance, and spare part stocks etc)

Original: *(P/M)*
Actual: (*PCR*)

4-2 O&M Cost and Budget

- The actual annual O&M cost for the duration of the project up to today, as well as the annual O&M budget.

(PCR)

5: Evaluation

5-1 JBIC and Borrower/Executing Agency Performance

Please evaluate the performance of the two bodies .

JBIC: *(PCR)*
Borrower/Executing Agency: *(PCR)*

5-2 Overall evaluation

Please describe your evaluation on the overall outcome of the project.

(PCR)

5-3 Lessons Learnt and Recommendations

Please raise any lessons learned from the project experience, which might be valuable for the future JBIC assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

(PCR)

IV. EX-POST EVALUATION

With necessary modifications suitable for PDMO, this Chapter is mainly based on JBIC's ex-post evaluation framework (five evaluation criteria), and standard procedures and key points for conducting an ex-post evaluation of a development project.

PART I: Framework for Ex-post Evaluation

1 Definition and Principles of Evaluation

(1) Definition of Evaluation

"Evaluation of development project" is "the work of assessing at the appropriateness of development project through investigating, analyzing and presenting judgments that are as objective as possible." To put it another way, evaluation is the work of systematic assessment for answering to questions such as "Was the project designed and implemented in a good way?" and "Did the assistance result in favorable changes for the beneficiaries and the target regions, and was there no adverse impact?"

(2) Principles of Evaluation

The DAC Evaluation Principles, which were adopted in 1991, have become the guideline for ODA evaluation systems in many countries. In the Principles, the DAC states its recommendations on implementation systems for the evaluation of development assistance, and on how to apply the five DAC evaluation criteria (relevance, efficiency, effectiveness, impact and sustainability). The key points of the recommendations are summarized in Box IV-1 below.

Box IV-1 Recommendations for Evaluation of Development Assistance Based on DAC "Principles for Evaluation of Development Assistance"

1. **Impartiality, independence, and building institutional structures for managing evaluation**
   Independent evaluation departments should be established within aid agencies to preserve the impartiality and independence of evaluations, but the system must also ensure thorough feedback of evaluation results to line management and decision makers.

2. **Credibility and usefulness**
   Making the evaluation process transparent and raising the expertise of evaluators ensures the credibility of the evaluations. Presentation of evaluation results to interested parties in a clear and timely manner makes evaluations useful in the planning and implementation of good assistance.

3. **Participation of the recipient country (executing agency) in evaluation**
   Participation in the evaluation leads to capacity building for the recipient, as well as encouraging dialog between thePDMO and recipient.

4. **Diversification of evaluation subjects**
   The spectrum of evaluation subjects should be broadened beyond individual projects to cover programs and policies, and more comprehensive evaluations should be conducted for sectors, themes and cross-sectional issues.

5. **Evaluation surveys based on the five DAC evaluation criteria**
   Evaluate in accordance with the five criteria of "relevance", "efficiency", "effectiveness", "impact" and "sustainability".

6. **Clear evaluation reporting**
   Clearly report evaluation results to interested parties through written reports with summaries, or through such measures as committees and seminars.

Source: OECD/DAC Principles for Evaluation of Development Assistance
(http://www1.oecd.org/dac/Evaluation/htm/evalpr.htm)

2 Five Evaluation Criteria

(1) What are the five evaluation criteria?

Many aid agencies use the five evaluation criteria (relevance, efficiency, effectiveness, impact and sustainability) recommended by DAC as an approach to comprehensive assessment of whether or not a project was satisfactory. These evaluation criteria are based on evaluation framework that was primarily developed in the US, with the addition of a perspective specific to development assistance. For evaluation on the project level or program level, evaluation questions are assembled in line with the five evaluation criteria, which also guide the gathering and analysis of information and the formation of conclusions. This approach can build a comprehensive system of diverse evaluation questions with relatively complete coverage. The general definitions of the criteria are as stated below.

Box IV-2 Definitions of the Five Evaluation Criteria by DAC

- **Relevance**
  The extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor.
- **Efficiency**
  The extent to which inputs lead efficiently to outputs.
- **Effectiveness**
  The extent to which an aid activity has achieved, or are likely to achieve, its objectives.
- **Impact**
  The positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended.
- **Sustainability**
  The extent to which the benefits of aid likely to continue after donor assistance ends.

Source: The DAC website (http://www1.oecd.org/dac/Evaluation/htm/evalcrit.htm)

(2) Ex-post evaluation of development projects and the five evaluation criteria

For evaluation surveys in line with the five evaluation criteria, more specific **evaluation questions** (questions to be answered through an evaluation survey) are set for each of the five criteria. Information is then gathered for each evaluation question using questionnaires and other investigation methods, and analyzed. The evaluation results are compiled into a report under each of the five criteria.

Table IV-1 lists the general evaluation questions for the ex-post evaluation of development projects, set in line with the five evaluation criteria, and the points for consideration in setting them.

Table IV-1 General Evaluation Questions
(ex-post evaluation of Development projects)

Relevance **Do the objective and approach of the project match the priorities and policies of the target group, partner country and donor?** ✓ "Relevance" only examines the appropriateness and necessity of the plan, without reference to performance. Analysis that says "the project objectives were achieved and therefore the plan was relevant" is inappropriate.	
☐ **Consistency with development policy**	Do the overall goal and project purpose match the development policies of the partner country (or target region) and the aid policies of Japan and JBIC? Did the project have a high priority or a high level of urgency?
☐ **Matching beneficiary needs**	Did the project match the needs of its beneficiaries?
☐ **Appropriateness of the project scope and approach**	Was the project plan (scope and approach) at the time of the appraisal determined appropriately to attain the overall goal and project purpose?
☐ **Relevance of alterations in project scope**	If there has been a major alteration in project scope after the start of the project, was the alteration appropriate, considering its necessity? If the alteration was inappropriate, what was the cause?
☐ **Relevance of plan at the evaluation stage**	Does the plan remain appropriate now, considering changes in project background and external factors such as sudden changes in the economic environment, policy changes, shifts in social values and standards? If it is no longer appropriate, what was the cause?
Efficiency **Did the input resources link efficiently to achievement of the outputs? Was the most efficient method used to produce the outputs?** ✓ Ideally, the level of efficiency should be judged by comparing the output per unit cost (of input) against other projects under similar conditions, or against benchmark data set by experts, but it is often difficult to do so in practice. The next best method is to judge that there was no problem with efficiency if the inputs and activities were carried out and the outputs achieved as planned.	
☐ **Achievement of outputs (completeness of outputs)**	Were the outputs achieved as planned? What were the promoting and impeding factors in achieving the outputs?
☐ **Implementation schedule efficiency**	Was construction finished in the planned time? If the time changed substantially from the plan, what was the cause and how was it handled?
☐ **Construction cost efficiency**	Was the project cost as planned? If the cost changed substantially from the plan, what was the cause and how was it handled?
☐ **Appropriateness of the project implementation scheme**	Was there a system able to take the various decisions and handle monitoring and troubleshooting of project implementation? (The implementation ability of the executing agency, contractors and consultants, cooperation with JBIC, related agencies and community organizations, others).
Effectiveness **Achievement of project purpose. To what extent did the project's outputs contribute to the achievement of its purpose?** ✓ Mainly use comparison of planned and actual values for operation and effect indicators. If there are no planned values, judge whether the absolute values are adequate. ✓ Effects that cannot be quantified are also surveyed.	
☐ **Use and operation of outputs**	Are project outputs being used adequately? (Mainly compare planned and actual "operation indicators") If not, what is the cause?

☐ **Achievement of project purpose**	Have the direct project effects been adequately realized, and have the project purpose been adequately achieved? (Mainly compare planned and actual "effect indicators") What factors promoted or impeded achievement of the purpose?
☐ **Relationship between outputs and the achievement of project purpose**	How much did the project outputs contribute to achievement of project purpose? If there are training and technical assistance (T/A) components, investigate whether they contributed to the achievement of project purpose.
☐ **Achievement of EIRR and FIRR targets**	Did EIRR and FIRR performance reach adequate levels compared to planned values?
Impact **Was the intended overall goal of the project achieved? Also, what were the intended/ unintended, positive/ negative, direct/ indirect changes on technical, economic, socio-cultural, institutional and environmental aspects?** ✓ Examine from multiple cross-cutting issues, and always check whether there has been any impact on the natural environment and any impact of resettlement and land acquisition. If such impacts are present, they should be included in the evaluation questions. ✓ In cases where it is difficult to obtain quantitative data, evaluate on the basis of qualitative data.	
☐ **Contribution to achievement of the overall goal**	Was the "overall goal" achieved? Can it be achieved in the future? How much did the project contribute to achieving the goal?
☐ **Impact on the natural environment**	What kind of impact did the project have on the natural environment of the project area? If there was any negative impact, was it anticipated from the first stage of the plan?
☐ **Impact of resettlement and land acquisition**	What kind of impact on the community was associated with resettlement and land acquisition?
☐ **Impact on policies and institutional systems**	What kind of impact did the project have on the country's development policies and institutional systems in the target sector? Was the impact favorable?
☐ **Socio-economic impact**	What kind of impact did the project have on the society and economy (job creation, alleviation of poverty, improving the status of women, improving public participation and other aspects) of the target area? Was the impact favorable?
☐ **Impact on technology**	What kind of contribution did the project make to technological improvement and innovation in the target country?
Sustainability **To what extent will the agencies and organizations of the counterpart country be able to maintain the outputs and benefits of the project? What tasks remain for the future?**	
☐ **Operation and maintenance status**	Do the outputs receive appropriate operation and maintenance? Are the facilities in good condition?
☐ **Operation and maintenance system**	Are the provisions for operation and maintenance appropriate? These include organizational systems, personnel (quality and number), working procedures (manuals), skills, facilities and equipment for maintenance, and spare part stocks and procurement. Do the agencies and organizations have ownership?
☐ **Financial resources for operation and maintenance**	Are sufficient financial resources available for appropriate operation and maintenance? Are those resources expected to remain available in the future? In addition to the financial strength of the executing agency, investigate whether there is financial support from the government.
☐ **The environment surrounding the project**	Is the project expected to be needed in the future? Can the conditions (nature, politics, policy, institutional systems, markets, other related projects) necessary for maintenance of project benefits be expected to develop in the future?

PART II: Procedure for Ex-post Evaluation

The procedures for ex-post evaluation of development projects can be broadly divided into three steps:
[1] evaluation design,
[2] preparation and implementation of field survey, and
[3] conclusion of evaluation.

Figure IV-1 shows the content of each step. The tasks below are standard, and they may be modified as appropriate to suit the purpose of the ex-post evaluation or constraints on its time or budget. Furthermore, the tasks are not necessarily carried out in the sequence shown in Figure IV-1. Multiple tasks can proceed in parallel, and the plan can be revised in light of new information obtained through a preliminary survey (a field survey carried out preliminary to gather information).

Figure IV-1 Procedure for the Ex-post Evaluation of Development Projects

1. Evaluation design	(1-1) Setting the purpose of the evaluation (1-2) Examining the project summary (plan, performance, history) (1-3) Checking available survey resources (1-4) Drawing up the **evaluation work plan** (Consider key evaluation questions and survey analysis methods) (1-5) Drawing up the **evaluation grid**. (Consider evaluation questions and data collection methods)
⇩	
2. Preparation and implementation of the field survey (Note)	(2-1) Preparing the field survey (2-2) Gathering information through the field survey
⇩	
3. Conclusion of evaluation	(3-1) Analyzing the survey results (3-2) Deriving lessons learned and recommendations (3-3) Writing the evaluation report

Note: In many cases, two field surveys are conducted, namely a **preliminary survey** and a **main survey**. A preliminary survey is implemented to prepare for the main survey, often including the gathering of additional information, or for selecting local consultants to implement the **fieldwork**. (In this handbook, the term “fieldwork” will be used to refer to a survey conducted over a period of time to gather information from beneficiaries and other parties.)

1 Evaluation Design

An evaluation design is a plan concerning what to find in an evaluation and how that evaluation will be conducted. Figure IV-2 shows a standard process flow.

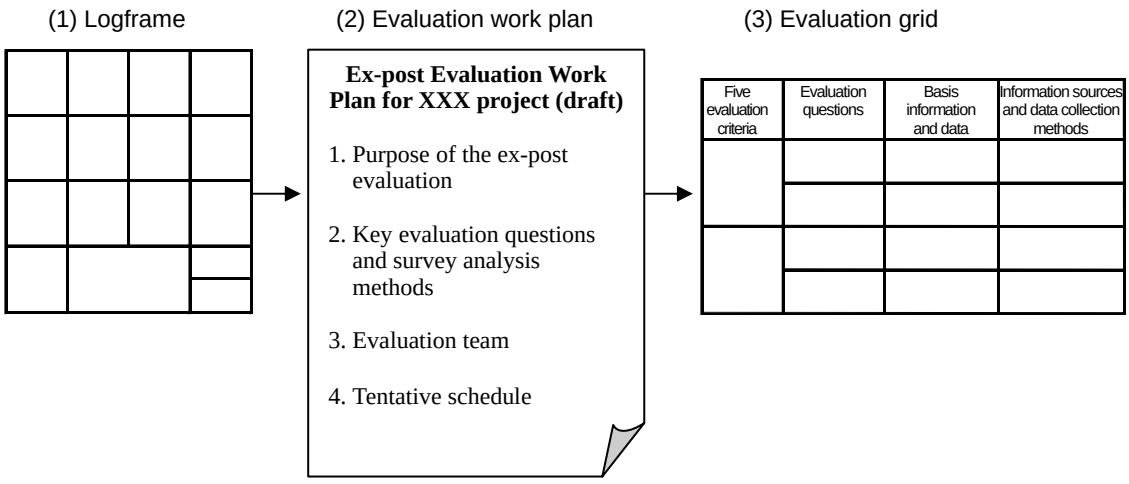
[1] Draw up the **logframe** to organize the project summary.

[2] Decide the broad outline of the evaluation survey (purpose, key evaluation questions and survey analysis methods, the evaluation team, tentative evaluation schedule) and record the outline in the **evaluation work plan**.

[3] Use the **evaluation questions and information/data sources** to consider evaluation questions and data collection methods for the detailed evaluation plan.

This section will explain the points that must be considered at each stage of the evaluation plan, in line with the workflow of the process.

Figure IV-2 Documents to Prepare at the Evaluation Design Stage



(1) Setting the purpose of the evaluation

The purpose of ex-post evaluations, in general, is to derive lessons and recommendations, and to ensure accountability. In addition, individual ex-post evaluations can have separate aims. When starting an ex-post evaluation, it is important to consider demands from concerned parties and prepare an evaluation plan that can yield hints and lessons useful to them. For a valid evaluation, it is essential to reconfirm the purpose, and to prepare an evaluation plan keeping in mind its readers, timing required, and use. The following are example of possible purpose for ex-post evaluation.

Ex-post evaluation purposes (examples)

- The project was expected to become a trigger by implementing as a showcase for industries to install emission reduction devices, so to what extent it has prevailed in industries, and factors to contribute and factors to hinder are to be examined.
- This project raised environmental issues, so the facts should be checked and recommendations on any points in need of improvement should be presented to the recipient country.

- The project has shown results in improving the living standards of beneficiary residents, so the keys for success should be investigated and applied to future projects.
- The appraisal of the subsequent project is scheduled to begin in half a year, so the lessons learned from the completed project should be applied to the formulation of its successor.

(2) Examining the project summary (plan, performance, history)

1) Preparing the logframe

Prepare the logframe, if it is not readily available to examine what the project intended to achieve.

The following points must be noted when preparing a logframe retrospectively from data compiled at the appraisal stage.

[1] Clarification of project purpose and overall goal

The “project purpose” of an Development project is the direct benefit to the beneficiaries that is expected to materialize through the operation and use of the outputs of the project (such as facilities, equipment). The “overall goal” is the goal or direction of the long-term development plan to which the project contributes. In many cases both are stated in the staff appraisal reports as “project objectives”, but there are cases in which the “overall goal” is not clearly stated, or there is no clearly stated distinction or causal relationship between the two. In such cases, the “overall goal” can be inferred from the “project background and necessity” or “project effects” stated in the staff appraisal report.

[2] Indicators and targets to be attained

“Operation and effect indicators” are used to measure quantitatively the operational status and the effects of the projects. These indicators are basically equivalent to the “project purpose” in the logframe. The ex-ante project evaluation report should clearly state the operation and effect indicators and their targets (both values and times). However, when logframes are drawn up for projects that preceded the introduction of the ex-ante project evaluation system, operation and effect-related indicators and their target values are derived from the staff appraisal reports and F/S documents. In the ex-post evaluation, if there is no collated actual data to compare against the set indicators, questionnaire surveys can be conducted and augmented with qualitative information.

Box IV-3 indicates points for considering when using a logical framework for evaluation.

Box IV-3 General Points to Consider when Using a Logical Framework in Evaluation

The logical framework is an appropriate method to clarify the plan content and evaluation criteria for a project under evaluation, but it is important to remember that the content recorded in the logframe is only part of the information needed for the evaluation. The logframe is an objective-oriented management method that clearly defines and arranges the measurable indicators for project objectives and outputs. Therefore if an evaluation only considers the content written in the logframe, it will become concentrated on the achievement of objectives and outputs, with the possibility that the important perspectives below could be overlooked.

[1] Project implementation process

Deriving specific recommendations and lessons requires evaluation not only of the project's achievement of indicator targets, but also of whether or not the implementation process was appropriate. In some cases the factors behind an unsuccessful resettlement of residents can be found in the project implementation processes, such as a lack of sufficient consultation with the residents. In other cases, even if the plan is completed, there is still the fact that an inappropriate process can cause problems such as negative impacts on the natural environment. Furthermore, in many cases, the project plan may be altered to meet the needs of the moment, which means that the logframe prepared on the basis of the initial plan is not always strictly applicable to ex-post evaluation. Therefore it is important for the evaluation questions used in evaluation to ask not only "what was done" and "what was achieved" with reference to the logframe, but also "how it was achieved".

[2] Qualitative aspects of project effects

The logframe uses indicators to measure the achievement of objectives as objectively as possible, making it easy to express the quantitative side of the project. However, taking the example of a railway rehabilitation project, there is the quantitative effect of increased travel speed, but there is also the qualitative effect of a more comfortable ride. The "project purpose" of logframe tends to record the effects that are easily expressed quantitatively, but ex-post evaluations must also investigate the qualitative effects. Such qualitative effects may be expressed quantitatively by carrying out a questionnaire survey. (e.g., the percentage of respondents who answered: "Ride has become more comfortable.")

[3] Points not to be recorded within the logframe

There are some important points that cannot be recorded within the logframe. Internal promoting or impeding factors that should be controlled in the project (some are stated in the staff appraisal reports for Development projects as "points of concern for project implementation and monitoring"), and side-effects (effects and impacts other than those mainly intended for the project) are not recorded within the framework due to its logical structure, but they are still needed for ex-post evaluation. As described previously, such information could be recorded outside the logframe for the purpose of evaluation. Also, in the evaluation of processes mentioned above, it is important to check how the internal factors raised in "points of concern for project implementation and monitoring" were actually dealt with in practice.

Note: Prepared on the basis of Minamoto (2001), *PCM syuhou to Kaihatsu Enjo Project Hyouka(PCM Method and Evaluation on Development Assistance Project) and PCM Shuhou no Riron to Katsuyo (Theory and Usage of the PCM Method)* edited by FACID/PCM dokuhonn Henshu Iinkai, p. 174, 176~178.

2) Examining project performance

Examine the main elements of project performance, as far as can be judged from existing documents. This task is necessary in order to find out what is known, what is not, and what information must be gathered in the field. The most important document for learning project performance is the **Project Completion Report (PCR)**, which presents project performance in terms of scope, implementation schedule and cost[43]. The obtained performance information can be written into the evaluation report form (described later) at any time, to enhance the efficiency of the evaluation work as a whole.

3) Learning project history

Record the main points of project history[44] in a chronological table, and confirm in advance whether there were any problems in the project planning and implementation processes. Important documents for learning the project's history are project documents and progress reports. The history of the project can be learned through interviews with staff responsible in executing agency and the consultants and contractors involved in the project.

(3) Checking available survey resources

Confirmation of survey resources (information, personnel, budget, time and other resources that can be used for the evaluation survey) is important for evaluation design, and the related information should be gathered as soon as possible.

1) Checking available information

Check what information can be obtained before the field survey. First check what documents are available within PDMO, other than the basic documents such as the staff appraisal report and PCR. If any studies have been conducted, obtain the related reports. Other valuable methods include interviews with staff in executing agency and others, and using the Internet to search for relevant documents from the government agencies and other donors. If a preliminary survey is conducted, additional information can be obtained in the field and available data can be identified, which makes evaluation designing easier.

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[43] Under loan agreements, the executing agency is usually mandated to submit the PCR within six months of the completion of the project. Consultants who have been employed for construction management often assist in the preparation of the PCR, and may submit a PCR to the executing agency that is separate from the one mandated under the loan agreement. If the PCR has not been received by the time of the ex-post evaluation, or if the content of the received report is inadequate, it will not be possible to gain a strong grasp of project performance before the field survey begins.

[44] F/S and the appraisal, loan agreement signing, start and completion of construction, completion of disbursement, and other notable events (such as the start and completion of resident relocation and other important events during the implementation of the project).

2) Identifying constraints on the budget, time frame and fieldwork

Budget and time frame should be considered together with the "combination of key evaluation questions and survey analysis methods" explained below, but their limits should be kept in mind in advance. Furthermore, for the fieldwork, check whether there are constraints on the timing and geographical area of the survey, such as (i) whether survey is possible in the monsoon season or the busy season for farming households; and (2) whether are areas where access is difficult. For example, would the survey be possible in the rainy season, or in busy farming seasons? Are any areas difficult to access?

(4) Drawing up the evaluation work plan (Consider key evaluation questions and survey analysis methods)

Evaluation questions are the questions to which the evaluation survey should find answers. In the ex-post evaluation of Development projects, it is common to set evaluation questions on the basis of all the five evaluation criteria (relevance, efficiency, effectiveness, impact and sustainability). Setting questions according to the five evaluation criteria is preceded by considerations of the focus points in the survey (**key evaluation questions**) and the **survey analysis methods** that will be used, since these can better estimate the personnel, time and budget required for the evaluation survey as a whole. Once the key evaluation questions and the survey analysis have been considered, the evaluation work plan should be drawn up, considering the above-mentioned available survey resources.

1) Considering key evaluation questions

The following points are important when considering the key evaluation questions.

<u>Points for considering key evaluation questions</u>

- Consider what is the most important thing to investigate to satisfy the purpose of the evaluation.
- Consider evaluation questions that should receive priority allocation of survey resources. In other words, consider which questions require the input of external experts and sample surveys of beneficiaries.
- In the case of ex-post evaluation, the key evaluation questions commonly concerning "effectiveness" and "impact" receive such a priority.

2) Considering survey and analysis methods for the key evaluation questions

Once the key evaluation questions have been set, consider the survey and analysis methods that offer the best chance of finding the answers. Consider what information should be sought, from where (who), and how it should be analyzed, to have an adequate level of confidence in obtaining answers. The key considerations for the survey analysis methods are as listed below.

A) Comparison and description

"**Comparison**" is the most basic method of evaluation. The main subjects for comparison

are [1] the project's planned and actual performance, [2] changes in the status of the target region or beneficiaries from before to after the project (**before/after comparison**), and [3] comparison of project beneficiaries and non-beneficiaries (**with/without comparison**). Each of these methods sets some kind of comparison criteria and compares them against the current situation. Evaluation of the achievement of the items stated in the logframe (performance) is equivalent to method [1], comparison of planned and actual performance. For most of the evaluation questions based on the five evaluation criteria, answers can be obtained by gathering and comparing data. For example, the following comparison method could be used for each of the evaluation questions.

Example of evaluation by comparison

- Evaluate the appropriateness of the project process by comparing the planned and actual inputs and activity schedule. If the inputs were made and activities completed as planned, conclude that the process was appropriate.
- Evaluate the efficiency of the project by comparing the ratio of inputs and outputs against that of similar projects, or against standard values set by experts. Judge efficiency is high if the output per unit cost exceeds the standard value.
- Evaluate achievement of outputs and project purpose by comparing indicators for each against preset target values, and conclude that they have been achieved if the target values are equaled or exceeded.
- Evaluate effectiveness and impacts by comparing changes in beneficiaries' status from before (or at the time of start) and after the implementation of the project, and conclude that the project has had some effect if the status has improved. Also compare the status of beneficiaries and non-beneficiaries after the project. If the improvement is only apparent among the beneficiaries, conclude that the project has had some effect.
- Evaluate the relevance of the project purpose by comparing it with overall plans and policies, and with beneficiary needs. Conclude that the purpose was relevant if there is close consistency with each other.
- Evaluate project sustainability by comparing the technical and financial ability of the project executor (government agency, community organization, and others) against the technology and finances required to maintain the project benefits.

However, even if the success or failure of the project can be judged from the evaluation results gained from these comparisons, it is difficult to grasp the background to the project, such as the history of project implementation and effect manifestation and the factors that promoted or impeded achievement of its objectives. A detailed understanding of the project is essential if lessons are to be learned from the evaluation and applied as feedback for later projects. Particularly in the field of development assistance evaluation, there is a growing demand for improved training and assistance through evaluation, and only using the comparison approach is no longer adequate.

"**Description**" can be used as an evaluation approach that does not rely on comparison. This approach describes the history of project implementation, its performance and effects.

Its main aim is to gain clear understanding of project status as it is. The following are an example of evaluation by description.

Example of evaluation by description

- Investigate the factors promoting achievement of outputs and objectives by describing the process from achievement of inputs and activities to achievement of objectives, and then beyond to the manifestation of the ripple effects and side effects.
- Investigate the factors impeding achievement of outputs and objectives by describing the project implementation process and identifying problems.
- Investigate the factors promoting and impeding achievement of outputs and objectives by describing the changes that occur in assumptions or external factors.
- Evaluate sustainability by describing the organization of the agencies and community organizations that implement the project.

Evaluation by description gives depth to the evaluation with a traditional focus on accountability. It also enhances the function of evaluation as management support tool through feedback of results. In participatory evaluation, which has recently come to the fore (evaluation carried out with the aim of enabling the project-related parties who participated in the evaluation to learn from it), there is a style in which the project is only described, without any use of the comparison method.

B) Quantitative and qualitative studies

It is generally believed that the most appropriate way of carrying out a comprehensive evaluation is to combine both quantitative and qualitative study methods. There are no firm definitions of quantitative and qualitative[45], but in this handbook **quantitative study** methods are those in which judgments are based on numerical data (various measured values, average values, frequency distributions, ratios, recurrence coefficients etc.) and **qualitative studies** use other methods of expression (mainly text, with maps, photographs, diagrams, others). Therefore quantitative data is numerical data and qualitative data takes non-numerical forms. The methods of comparison and description described in 1) above do not necessarily deal with one data form or the other. In some cases qualitative data can be compared (for example, photographs can be used to compare the state of the target region before and after implementation of the project), and quantitative data can be described without comparison (such as for the evaluation of the sustainability of the project through description of the state of maintenance by the project executing agency).

The points presented in Table IV-2 are often stated as advantages and disadvantages of quantitative studies and qualitative studies, but when the two types are used in combination, they can complement each other's shortcomings. Typically, changes in the

[45] For example, "Bamberger (2000) *Integrating Quantitative and Qualitative Research in Development Projects*" presents various definitions of the terms qualitative and quantitative.

target area are revealed by quantitative study, and the causes and processes behind those changes are investigated by qualitative study. The quantitative study ascertains overall trends of change in the target area, while the qualitative study gives a detailed understanding of the region's characteristics.

Table IV-2 Advantages and Disadvantages of Quantitative and Qualitative Studies

	Advantages	Disadvantages
Quantitative study	· Results are reproducible because measurement methods are consistent. · Evaluation results can easily be generalized. · Project performance can be presented in a visible form. · The magnitude and extent of project effects can be presented in a form that is easy to understand. · The methodology is well established and backed by abundant documentation.	· It is difficult to understand the factors behind the information gathered. · It is difficult for formal interviews and questionnaires to reflect what people really think (particularly concerning sensitive topics). · Data collection often requires large amounts of time and cost. · Methods can easily become inflexible, making it difficult to make radical changes if problems arise during a survey.
Qualitative study	· This method is well suited to understanding the project implementation process and the causal factors in its background. · It is easier to gather information on sensitive topics and inaccessible survey subjects (such as vulnerable groups). · Easily adaptable to changes in the survey environment.	· It is difficult to reproduce the same kind of survey. · Evaluation results are difficult to generalize. · Bias and preconceptions from the investigators can distort data. · It is difficult to systematize the analysis of large volumes of diverse data.

Source: JICA (2002) *Jissenteki Hyoka Syuhou (Practical Evaluation Method): JICA Project Evaluation* Guidelines, Kokusai Kyoryoku Shuppankai, p.115 (http://www.jica.go.jp/evaluation/index.html); Bamberger, M. (ed) (2000) *Integrating Quantitative and Qualitative Research in Development Projects*, World Bank, pp.11-13.

C) Methods for selection of survey subjects (sample surveys and case studies)

For projects carried out nationwide or over wide areas, some method must be devised to select survey areas, so that the evaluation can be completed within the time and cost constraints. For projects that target a specific area, it may be necessary or possible to survey all (survey the entire population), such as examinations to measure the effects of education and training programs, or inspections of constructed facilities. Nevertheless, it is usual to select subjects to actually investigate (such as questionnaire or interview respondents) to measure the changes that have occurred with the beneficiaries.

There are two main approaches to the selection of survey subjects, depending on what is to be investigated. The **sample survey** aims to select subjects that represent the whole (the population) as well as to identify overall trends. The **case study** approach aims to yield a deeper understanding of the situation (such as changes in the project area) in order to derive lessons for the future. It aims to select one or more specific cases (successful, unsuccessful, and average cases). The aim of the sample survey is to generalize the survey results to the population, while the case study approach emphasizes

understanding of particular phenomena.

3) Considering survey schedule

In many cases, two field surveys are conducted, first the preliminary survey and then the main survey. The preliminary survey is used to gather additional information to prepare for the main survey, or to select the consultants who will perform the fieldwork. The evaluation work plan may be finalized on the basis of the preliminary survey. The length of the survey schedule varies between evaluations, but usually a preliminary survey lasts for around one week and the main survey for around two. If fieldwork is carried out for an ex-post evaluation, it takes 2~5 months, necessitating a longer schedule overall.

4) Considering survey budget

Survey budgets vary greatly depending on the scale of the fieldwork. Prepare the evaluation plan to enable the most effective and reliable fieldwork possible within the budget.

(5) Drawing up the evaluation grid (Consider evaluation questions and data collection methods)

The evaluation work plan discussed the broad outline of the evaluation plan, based on the key evaluation questions and the survey analysis methods. For a more detailed evaluation design, prepare an evaluation grid that is the table showing the combination of specific evaluation questions and data collection methods. The evaluation grid enables a comprehensive examination of “what information should be obtained on what subjects, and from where”. Based on the evaluation grid, the questionnaires for interviews and surveys, and the TOR for the fieldwork can be prepared. The following explanation is of a case in which the evaluation questions cover not only the key evaluation questions but also all the five evaluation criteria.

1) Considering evaluation questions in line with the five evaluation criteria

The key points for setting evaluation questions are described below.

<u>Key points for setting evaluation questions</u>

- Pick questions relevant to the project from “Table 1-1 General Evaluation Questions Based on the Five Evaluation Criteria (ex-post evaluation of Development projects)”. Set the specific evaluation questions based on the prepared logframe and the information gained so far on project performance. (See the “evaluation questions” column of Table 2-3).
- Besides examining what the project achieved, use questions directed at whether the project implementation process was appropriate. (For example, ask whether the project implementation scheme was appropriate in terms of the “Efficiency” criteria. Examine whether the impact caused by resettlement and the implementation process

was appropriate.

- If the answers to any of the evaluation questions are known from existing documentation, the answers should be entered somewhere in the evaluation grid or in the report form.

2) Considering the supporting factors for the evaluation

Once the evaluation questions have been set, consider what information and data can serve as the supporting factors for answers to those questions (See the “Basis information and data” column of Table 2-3). For example, if there were an evaluation question asking “Do the shanty dwellers have a better living environment in the resettlement areas?”, information such as “degree of improvement to residential hygiene in the resettlement sites” would serve as a supporting factor for the answer. At this point the most specific and concrete data and indicators should be collected (e.g. the change in the incidence of water-borne diseases). This will make it much easier to produce questionnaires for interviews and sample surveys.

3) Considering data collection methods for each evaluation question

Next, consider the information sources and data collection methods to be used for the “basis information and data”. The key points of data collection methods are described below.

Key points for considering data collection methods

- Examine what data should be collected from where, in the framework of the set evaluation work plan.
- Examine the most appropriate data collection methods and their combination
- It is preferable to use multiple information sources. For example, the receipt of resident relocation funds can be cross-checked by gathering information from both the recipients (the residents) and the provider (the government), enabling objective analysis.

2 Preparation and Implementation of the Field Survey

The next step is to prepare for the implementation of field survey (including any fieldwork) on the basis of the evaluation design.

(1) Preparing the field survey

Questionnaires to send to the executing agency and related agencies should be drawn up in preparation for the field survey. Consider the questionnaires, fieldwork TOR and questions on the survey questionnaires on the basis of the evaluation grid. The various operations are briefly explained below.

1) Writing the questionnaire for the executing agency and other agencies

Answers to questionnaires submitted to the executing agency and other agencies consist the most basic information. Key points of the questionnaires are discussed below.

Key points when writing questionnaires for the executing agency and other agencies

- Check that the content of the questions falls within the work and authority of the agency, and make the questions as specific as possible.
- Besides officials of the executing agency, others may be suitable respondents to questions on policies and statistics. Choose respondents with care.
- When asking questions on quantitative data, prepare tables so that the respondent can easily write in numerical values.
- Take care to avoid asking too many questions (one option is to assign an order of priority to questions).

2) Writing the TOR for the fieldwork

If any fieldwork is included in the evaluation design, draw up the TOR for consultants involved in the fieldwork. The main terms to be included in the TOR are stated below.

Main terms to be included in the TOR

- Survey background (project summary, overall ex-post evaluation design)
- Objectives of the survey
- Scope and methods
- Schedule

3) Checking the questionnaire for the fieldwork

If the fieldwork is going to include a questionnaire survey, the way the questionnaires are prepared is very important for the evaluation survey, and therefore the staff-in-charge should check the following points.

Key points in making questionnaires

- Rather than putting everything down, focus the questions on what really needs to be known.
- Write the text in a concise and simple style.
- Use Thai and simple expressions for the questions that will leave no scope for misunderstanding.
- Ask for only one answer to each question.
- Put questions that are easy to answer (such as name and family members) at the start.
- Carry out a pre-test before finalizing the questionnaire content.

(2) Gathering information through the field survey

1) Gathering information from relevant agencies

Send the questionnaire so that it reaches a suitable respondent at the executing agency or other related agencies at least two weeks before the field survey begins, in order to gather information efficiently in the field survey. Conduct interviews based on responses to the questionnaire, and if there is any ambiguity in the data, check with the information provider. If any problems are mentioned in the responses, the cause and effect relationship with the project should be clarified.

2) Gathering information through fieldwork

Depending on composition of the evaluation team members, the assignments defer case by case. Each member will collect information at the field through interview, observation, and data collection according to his/her TOR.

3 Conclusion of Evaluation

The final step is to conclude the evaluation. The procedure is explained below in (1) Analyzing the survey results, (2) Deriving lessons learned and recommendations, and (3) Writing the evaluation report.

(1) Analyzing the survey results

Analyze the information and data collected from existing documents and the field survey to find the answers to the questions set in the evaluation design (the evaluation questions).

Key points of analysis of survey results

- Record changes over time in “the operation and effect indicators” that show how well objectives were achieved, and consider whether the changes were brought about by the project. If objectives have not been achieved, the impeding factors must be analyzed without fail.
- In many cases, no target indicators are set before the project, or accurate data for indicators cannot be collected in the ex-post evaluation. In such cases, note the limitations on the available data, and proceed to analyze changes before and after the project using the results of interviews and questionnaire surveys.
- Quantitative data such as questionnaire survey results should be collated into groups by respondent characteristics (this is called **“cross collation”**) to identify trends in the realization of effects.
- If a qualitative survey is conducted together with the quantitative survey, examine the information gathered by the qualitative survey to identify factors behind the results of the quantitative survey.
- Analyze the project process to look for the mechanisms of manifestation of outcomes and impacts (both positive and negative).

(2) Deriving lessons learned and recommendations

Derive recommendations and lessons learned from the results of survey and analysis. Feedback of valuable recommendations and lessons learned is the purpose of evaluation, and therefore the content should be specific, with strong potential for practical implementation.

1) Deriving lessons learned

Lessons learned are defined as “points that are, to some extent, generally applicable to similar projects as feedback”.

Key points for deriving lessons learned

- Consider the strengths and weaknesses of the project under evaluation, and whether the experiences of that project can be reflected in the planning and implementation of

similar projects (including subsequent projects). Lessons learned from successful examples should also be given full coverage.

- Discuss situations in which the lessons learned would be applicable.

2) Deriving recommendations

Recommendations are defined as "points that could help the executing agency, or others to improve the relevant project".

Key points for the derivation of recommendations

- Consider what short-term actions should be taken by the executing agency or JBIC to enhance the effects and sustainability of the completed project, or what policies the borrower country should take from the long-term perspective.
- After identifying practical constraints, state specifically who should do what, and by when.
- Include specific solutions, rather than simply pointing out problems.

(3) Writing the evaluation report

First overall points to consider in writing the report are noted, before stating the key points when filling out the standard report form, as shown in Box 2-2.

1) Points to consider when writing the report

Consistent logic through the whole report is important

The items recorded in the report must not be independent and unrelated. Instead, care should be taken to interlink them and ensure logical consistency.

- Record the achievement of "project purpose" under "effectiveness" of five evaluation criteria.
- Record the contribution made by the project to the "overall goal" under "impact" of five evaluation criteria.
- The five evaluation criteria are inter-related. For example, a problem with the operation and maintenance (under "sustainability") can be linked to a low level of "effectiveness".
- Overall evaluation findings should be condensed into "recommendations and lessons learned".

Simple, clear writing

- Take care to write in a style that is concise, simple and easy to understand.
- It is not always necessary to record results for every detailed evaluation question. Summarize only the important points.
- Important subjects, such as changes over time in the "operation and effect indicators" representing effectiveness (achievement of objectives), should be presented visually, using graphs or tables.
- Make a clear statement of the situation before and after the project, what was

needed then, what kind of facilities the project built, and what kinds of changes resulted.

- Write technical content in plain terms that will be clear to the general reader, and use footnotes and other means to add explanation where necessary.

State judgments as well as facts, and state the facts behind the judgments

- In addition to stating facts, such as records of indicators, analyze those changes in order to state judgments.
- Conversely, any judgment must be backed by statement of the facts (survey results) on which it is based.

2) Key points for writing the report according to the report form

Box IV-4 is a standard form for an evaluation report, with the key points to fill out marked by “ ”.

Box IV-4 Project Ex-post Evaluation Report Form

Project Name:

Report date: Month Year
Field survey: Month Year

Map of project area
Photograph

1. Project Profile and Japan's Development

(1) Background: "Refer to the staff appraisal report. Give a clear statement of the country's high-level plans, the need for the project, and the situation in the project area before the project."

(2) Objectives: "Base this section on "Project objectives" from the staff appraisal report. In many cases the staff appraisal report does not draw any clear distinction between "project purpose" and "overall goal", combining them under "Project objectives". The two should be distinguished on the basis of the logframe examination to give a clearer statement of the process of effect realization that the project aims to achieve."

(3) Project Scope: "Copy from the staff appraisal report."

(4) Borrower/ Executing Agency:

(5) Outline of Loan Agreement:

Loan Amount/ Loan Disbursed Amount	¥[46] million/ ¥ million
Exchange of Notes/ Loan Agreement	month year / month year
Terms and Conditions	Interest: %, Repayment period: years (years of grace period) Procurement conditions (general untied, etc.)
Final Disbursement Date	Year month

[46] Though Yen mark is put here temporarily, it should be an relevant foreign currency.

2. Results and Evaluation

In many cases, the evaluation results are stated under each of the five evaluation criteria, as shown below, but that need not be the case for some evaluation purposes, such as when the evaluation is to emphasize a certain theme. Refer to “Part I Section 2 Five evaluation criteria”for details of what to write under each of the five evaluation criteria.

(1) Relevance:

(2) Efficiency:

(3) Effectiveness: Use graphs to present movements in operation and effect indicators.

State planned and actual IRR values and state the reasons for any discrepancy.

(4) Impact:

(5) Sustainability:

3. Lessons learned

State “points which are, to some extent, generally applicable to similar projects as feedback”, based on the evaluation results. (Do not present new findings here.)

4. Recommendations

State “points which could help the executing agency, or othres to improve the relevant project”, based on the evaluation results.

Comparison of Original and Actual Scope

Mainly refer to the staff appraisal report and the PCR to state planned and actual figures for project scope, implementation schedule and project cost.

Item	Plan	Actual
Project Scope		
Implementation Schedule		
Project Cost		
Foreign currency	¥ million	¥ million
Local currency	¥ million	¥ million
	(Local currency)	(Local currency)
Total	¥ million	¥ million
Development portion	¥ million	¥ million
Exchange rate	1 ＝ ¥	1 ＝ ¥

State the local currency portion of project cost in terms of both local currency and foreign currency.

The exchange rate should be a weighted average value for the disbursed value over the whole period of the loan. It should be calculated from the values of local currency payments (and their Yen equivalents) recorded in the PCR. If that is not possible, use IFS (*International Financial Statistics*, IMF) or others to produce a simple average over the loan period.

SAMPLE QUESTIONNAIRE FOR EX-POST EVALUATION

Objectives of the Survey:

The main objectives of the survey are:

1) **to review the implementation of the project and to assess the effectiveness of and impacts resulting from the project, so that we may draw valuable lessons to be reflected in future JBIC projects and thereby enhance the quality of JBIC's assistance; and**
2) **to review the current situation, operation, maintenance and management of the completed projects, so that we may make recommendations, if necessary, to the Borrower/Executing Agency to ensure proper operation in the future.**

Contact Person:

(1) Name:
(2) Position/Title: xxx, Project Management Department, Metropolitan Waterworks Authority

Basic Concept of Evaluation:

Post evaluation on JBIC-financed projects is exercised in view of five evaluation criteria, i.e. **(1) Relevance, (2) Efficiency, (3) Effectiveness, (4) Impact,** and **(5) Sustainability**.

This Questionnaire consists of five parts (from Block A to E). Each part/block has questions relating to five evaluation criteria. If information or data requested in this Questionnaire is not readily available, please kindly provide alternative indicators and data, which meet the objectives of this questionnaire survey under the five evaluation criteria.

Five Evaluation Criteria

Evaluation Criteria		Expected Respondent to Questionnaire
(1) RELEVANCE	Question whether project objectives, overall goals, and project scope were/are in line with the priority needs and concerns of the recipient country at the time of the project appraisal as well as the post evaluation. This criteria will focus on the recipient country's development policy/plan, the needs of beneficiaries, and the donor's policy.	- Project Management Department, MWA
(2) EFFICIENCY	Measure how efficiently the various inputs are converted into outputs of the project during the implementation process (productivity of implementation process). This criterion will examine the appropriateness of inputs such as project cost and its volume, implementation schedule, timing, institutional/organizational function.	- Project Management Department, MWA
(3) EFFECTIVENESS	Examine the extent to which the project objectives have been achieved in relation to the outputs. This criteria will include quantitative analysis based on operation and effect indicators of JBIC, and will also include a re-calculation of the Internal Rate of Return (IRR).	- Project Management Department, MWA
(4) IMPACT	Identify the extent to which the overall goal of the project has been achieved, and verify intended and unintended, direct and indirect, positive and negative changes in technical, social-economic, institutional and environmental aspects as a result of the project.	- Project Management Department, MWA
(5) SUSTAINABILITY	Question whether project benefits are likely to continue after completion of the project. This criterion will include a study of technical, institutional, and financial aspects in O&M agency/organization, condition and status of equipment/facilities procured by the project, technology transfer, and ownership of beneficiaries. It will also include an analysis of issues and constraints which may impede sustainability of the project.	- Project Management Department, MWA - Office of the Bangkhen Water Treatment Plant, MWA - Office of the Water Transmission and Distribution System, MWA

Project Summary:

(1) Background

TXVII-7: Fourth-2 and Fifth Project

The population in the Bangkok Metropolitan Administration (BMA) was forecasted to grow from 8,073 thousand in 1991 to 9,353 thousand in 1996. Consequently, this would lead to an increase in its maximum water supply demand from 3,460 thousand m^3 per day in 1992 to 4,330 thousand m^3 per day in 1996. Since the production capacity of water supply facilities at MWA at that time was only 3,780 m^3, there would be a supply-demand gap of 550 thousand m^3. Furthermore, the gap would continue to grow at 200 thousand m^3 annually to be as much as 1,090 thousand m^3 in 1999. In particular, the west bank area of Bangkok – where population grows rapidly – would suffer from a serious shortage of water supply, experiencing a supply-demand gap of 350 thousand m^3 in 1992 and 550 thousand m^3 in 1999.

In addition to the water supply shortage, BMA had a serious land subsidence problem because of an overuse of ground water. The MWA service coverage area accounted for only 23% (710 km^2) of BMA, and people use ground water for domestic use.

Thus, in order to cope with the increasing water supply demand of BMA, it was highly desirable to expand a water supply capacity of MWA by expanding its facilities and reducing a water leakage. This was also supported by the country's Seventh National Economic and Social Development Plan (1992-1996), as it emphasized the importance of basic infrastructure that would enable the Thai economy to grow sustainably. In the water supply sector, it planned to expand the capacity of facilities and reduce a water leakage, thereby increasing the amount of national water supply by 3.3 million m^3 per day (Bangkok Metropolitan Administration, 1.7 million m^3; Other Regions, 1.6 m^3).

TXVIII-7: Networks System Project

The Fourth and Fifth Project above would expand the water supply capacity of MWA to 4,560 thousand m^3 per day, thereby coping with the increasing water supply demand. However, a water distribution capacity of MWA still remained weak, and there was a plan to expand pumping facilities based on the 1990 Bangkok Water Supply Master Plan. The Networks System Improvement Project intended to respond to this need.

(2) Objectives

TXVII-7: Fourth-2 Project

To improve the MWA water supply system to cope with the increase in water demand in compliance with growth pattern of town and city planning and to expand the service area to a greater extent, especially in the eastern part of Bangkok, thereby reducing the use of ground water, both by government agencies and private individuals, in concurrence with the government's remedial measures on groundwater crisis and land subsidence problem.

TXVII-7: Fifth Project

To improve the MWA water supply system to cope with the increase in water demand particularly on the west bank part of Bangkok by constructing a new water treatment plant in order to utilize raw water from new resources, where the amount of raw water extraction for water supply is limited, other than the Chao Phraya river.

TXVIII-7: Networks System Project

To improve the MWA water distribution system to cope with the increase in water demand in the central area of Bangkok by expanding the capacity of water distribution pumps, replacing the existing pipelines, and constructing new pipelines.

(3) Project Scope

TXVII-7: Fourth-2 Project

1) Raw Water Canal [JBIC]
2) Pumping Station [JBIC]
3) Transmission Branch Conduits/Trunk Mains [JBIC] [MWA]
4) Consulting Services [JBIC]

TXVII-7: Fifth Project

1) Water Treatment Plant [MWA]
2) Trunk Mains [JBIC] [MWA]
3) Land Acquisition [MWA]
4) Distribution Pipelines [MWA]
5) Consulting Services [JBIC] [MWA]

TXVIII-7: Networks System Project

1) Pumping Station [JBIC]
2) Trunk Mains [JBIC] [MWA]
3) Distribution Pipelines [MWA]
4) Consulting Services [MWA]

(4) Borrower/Executing Agency

Borrower	Executing Agency
Kingdom of Thailand	Metropolitan Waterworks Authority

(5) Outline of Loan Agreement

TXVII-7 (Fourth-2 and Fifth)

Loan Amount Loan Disbursed Amount	16,969 million yen 11,663 million yen
Date of Exchange of Notes Date of Loan Agreement	December 1992 January 1993
Terms and Conditions - Interest Rate - Repayment Period (Grace Period) - Procurement	 3.0% p.a. 25 years (7 years) General Untied
Final Disbursement Date	November 2000

TXVIII-7 (Networks System)

Loan Amount Loan Disbursed Amount	5,599 million yen 3,730 million yen
Date of Exchange of Notes Date of Loan Agreement	September 1993 September 1993
Terms and Conditions - Interest Rate - Repayment Period (Grace Period) - Procurement	 3.0% p.a. 25 years (7 years) General Untied
Final Disbursement Date	January 2001

Block A: Relevance

(Note) The Block A examines whether or not the project objective was/is in line with the priority needs and concerns of the Kingdom of Thailand at the time of appraisal and post evaluation.

(A-1) Please carefully examine the project objectives of the Fourth Project (2), Fifth Project, and Networks System Project. Kindly consider whether the project objective met the development policy and plan in Thailand at the time of project appraisal and it is still in line with the present policy and plan at the time of post evaluation.

Fourth-2:
"To improve the MWA water supply system to cope with the increase in water demand in compliance with growth pattern of town and city planning and to expand the service area to a greater extent, especially in the eastern part of Bangkok, thereby reducing the use of ground water, both by government agencies and private individuals, in concurrence with the government's remedial measures on groundwater crisis and land subsidence problem."

Relevance at the time of project appraisal

Relevance at the time of post evaluation

Fifth:
"To improve the MWA water supply system to cope with the increase in water demand particularly on the west bank part of Bangkok by constructing a new water treatment plant in order to utilize raw water from new resources, where the amount of raw water extraction for water supply is limited, other than the Chao Phraya river."

Relevance at the time of project appraisal

Relevance at the time of post evaluation

Networks System:
"To improve the MWA water distribution system to cope with the increase in water demand in the central area of Bangkok by expanding the capacity of water distribution pumps, replacing the existing pipelines, and constructing new pipelines."

Relevance at the time of project appraisal

Relevance at the time of post evaluation

(A-2) In relation to the previous question, you are kindly requested to provide copies of policy documents such as the recent National Economic and Social Development Plan (especially, a portion related to urban water supply) and the MWA Corporate Plan, which support your answer.

(A-3) Please identify the current water supply demand in Bangkok and state your views and comments on to what extent the project facilities meet (or do not meet) such demands.

Block B: Efficiency

(Note) In the Block B, the appropriateness of inputs such as project cost and its volume, implementation schedule, timing, institutional/organizational function will be examined.

(B-1) Project Scope

(1) The following tables are prepared based on the appraisal reports and the PCRs. Please kindly check the actual project scopes again and fill in missing data.

Table 2-1a: Comparison of Original and Actual (Project Scope – Fourth-2)

Items/Activities	Original Scope (At Time of Appraisal)	Revised/Modified (PCRs)
1. Raw Water Canal [JBIC]	− Improvement of the existing Raw Water Canal from Sam Lae Raw Water PS to Bangkhen WTP (17.8km)	− Cancelled
2. Pumping Station (PS) [JBIC]	Lad Krabang Distribution PS − Construction of Lad Krabang Distribution PS with reservoir − Procurement/installation of power substation − Procurement/installation of 3 pumping units Bangkhen Raw Water PS − Procurement/installation of 1 pumping unit	− None
3. Transmission Branch Conduits/Trunk Mains [JBIC] [MWA]	JBIC Portion − Procurement/installation of transmission branch conduits − Procurement/installation of trunk mains	 − Modified (Please provide the details) − Modified (Please provide the details)
	MWA Portion − Procurement/installation of transmission branch conduits − Procurement/installation of trunk mains − Construction of distribution pipelines − Rehabilitation of distribution mains	 − Modified (Please provide the details) − Cancelled − Modified (Please provide the details) − Modified (Please provide the details)
4. Consulting Services [JBIC]	− Review of tender document − Assistance in evaluation of tender − Construction supervision * Please specify: ___M/M	− None * Please specify: ___M/M

Table 2-1b: Comparison of Original and Actual (Project Scope – Fifth)

Items/Activities	Original Scope (At Time of Appraisal)	Revised/Modified (PCRs)
1. Water Treatment Plant (WTP) [MWA]	−Construction of Maha Sawat WTP: raw water system; water treatment plant; clear water reservoir; distribution pumping station; civil work; and, construction of building and related works	−None
2. Trunk Mains [JBIC] [MWA]	−Construction of trunk mains	−Modified (Please provide the details)
3. Land Acquisition [MWA]	−Maha Sawat WTP	−None
4. Distribution Pipelines [MWA]	−Construction of distribution pipelines	−Modified (Please provide the details)
5. Consulting Services [JBIC] [MWA]	JBIC −Construction supervision for Maha Sawat WTP * Please specify: M/M	−None * Please specify: M/M
	MWA −Review of tender document −Assistance in evaluation of tender * Please specify: M/M	−None * Please specify: M/M

Table 2-1c: Comparison of Original and Actual (Project Scope – Networks System)*

Items/Activities	Original Scope (At Time of Appraisal)	Revised/Modified (PCRs)
1. Pumping Station (PS) [JBIC]	Pump building and related works at Bangkhen Electrical substation at Bangkhen Pump equipment −Bangkhen PS (3) −Klong Toey PS (1) −Lad Prao PS (1) −Pahol Yothin PS (1) −Sam Rong PS (1)	
2. Trunk Mains [JBIC] [MWA]	−Construction of trunk mains	
3. Distribution Pipelines [MWA]	−Construction of distribution pipelines	
4. Consulting Services [MWA]	−Construction supervision for pump station and related works * Please specify: M/M	* Please specify: M/M

* No PCR available

(2) If there are any revisions/modifications from the original scopes, please explain the reasons for each item.

Fourth-2

Fifth

Networks System

(B-2) Implementation Schedule

(1) The following tables are prepared based on the appraisal reports and the PCRs. Please kindly check the actual implementation schedules again and fill in missing data.

Table 2-2a: Comparison of Original and Actual (Implementation Schedule – Fourth 2)

Items/Activities	Original Schedule (Appraisal Report)	Actual Period (PCR)
1. Loan Agreement	Jan. 1993	Jan. 1993
2. Tender/Contract	Feb. 1993 – Nov. 1993	? – ?
3. Construction	Sep. 1993 – Feb. 1996	? – **Jun. 2000**
4. Consulting Services	Feb. 1993 – **Jun. 1996**	Feb. 1993 – Jun. 1997

Table 2-2b: Comparison of Original and Actual (Implementation Schedule – Fifth)

Items/Activities	Original Schedule (Appraisal Report)	Actual Period (PCR)
1. Selection of Consultants	Sep. 1992 – Apr. 1993	? – ?
2. Tender/Contract	Jun. 1993 – Nov. 1993	May 1992 – May 1993
3. Construction	Jul. 1993 – **Apr. 1996**	Dec. 1992 – **Jan. 2002**
4. Consulting Services	May 1993 – Mar. 1996	Aug. 1993 – Mar. 1996

Table 2-2c: Comparison of Original and Actual (Implementation Schedule – Networks System)*

Items/Activities	Original Schedule (Appraisal Report)	Actual Period (PCR)
1. Loan Agreement	Sep. 1993	Sep. 1993
2. Selection of Contractors	Jan. 1995 – Feb. 1996	? – ?
3. Tender/Contract (PS)	Aug. 1995 – Oct. 1996	? – ?
4. Construction (PS)	Jun. 1996 – **Apr. 1999**	? – ?
5. Tender/Contract (Trunk Mains, Distribution Pipelines)	May 1996 – Apr. 1999	? – ?
6. Construction (Trunk Mains, Distribution Pipelines)	Feb. 1995 – Dec. 1997	? – ?

* No PCR available

(2) According to the PCRs, the project completions for the Fourth Project (2) and Fifth Project were delayed by 50 months and 69 months, respectively. The PCRs mentions that the delays of both projects were caused by (i) change of construction conditions, (ii) flooding, (iii) delay of obtaining land permissions for trunk mains construction, etc. Please provide further explanation on each reason, and describe remedial measures taken for each.

[Change of construction conditions]

[Flooding]

[Delay of obtaining land permissions]

(3) Please state any effects caused by the schedule delays on the efficiency of the project implementation.

(B-3) Project Cost

(1) The following tables are prepared based on the project appraisal report and the PCRs. Please kindly check the actual expenditures and fill in missing data.

Table 2-4a: Comparison of Original and Actual (Project Cost – Fourth-2)

Breakdown of Cost Items	Original Estimate (At Time of Appraisal)			Actual Expenditure (PCR)		
	Foreign Currency (Mill. Yen)	Local Currency (Mill. Baht)	Total (Mill. Yen)	Foreign Currency (Mill. Yen)	Local Currency (Mill. Baht)	Total (Mill. Yen)
1. Raw Water Canal	420	28	564	--	--	--
2. Pump Equipment	1,120	25	1,248	444	12.6	476
3. Building & Reservoir of Lad Krabang PS	1,015	68	1,363	829	95.8	1,069
4. Electrical Substation of Lad Krabang PS	82	2	91	82	--	82
5. Branch Conduits	2,267	97	2,759	3,553	36.4	3,644
6. Trunk Mains	2,328	156	3,128	1,407	35.1	1,495
7. Consulting Services	110	26	244	125	43.2	233
8. Physical Contingency	724	38	917	--	--	--
9. Tax	--	312	1,590	--	--	--
10. MWA Portion	--	2,167	11,051	--	--	--
Total	8,066	2,919	22,955	6,440	223.1	6,999
(ODA Loan Portion: Mill. Yen)	(8,066)	(770)	(8,836)	(6,440)	(107)	(6,547)

Note: Exchange Rate
(Original estimate) *(Actual expenditure)*
B1 = ¥5.1 *B1 = ¥2.5*
(June, 1992) *(____, ____)*

Table 2-4b: Comparison of Original and Actual (Project Cost – Fifth)

Breakdown of Cost Items	Original Estimate (At Time of Appraisal)			Actual Expenditure (PCR)		
	Foreign Currency (Mill. Yen)	Local Currency (Mill. Baht)	Total (Mill. Yen)	Foreign Currency (Mill. Yen)	Local Currency (Mill. Baht)	Total (Mill. Yen)
1. Treatment Facilities	9,245	717	12,904	--	2,081.4	5,620
2. Distribution Facilities	5,887	398	7,916	4,795	339.3	5,711
3. Consulting Services	296	58	592	262	38.4	366
4. Physical Contingency	589	40	793	--	--	--
5. Tax	--	254	1,295	--	--	--
6. MWA Portion	--	3,056	15,584	--	3,199.3	8,638
Total	16,017	4,523	39,084	5,057	5,658.4	20,335
(ODA Loan Portion: Mill. Yen)	(6,772)	(1,361)	(8,133)	(5,057)	(71)	(5,128)

Note: Exchange Rate
(Original estimate) *(Actual expenditure)*
B1 = ¥5.1 *B1 = ¥2.7*
(June, 1992) *(____, ____)*

Table 2-4c: Comparison of Original and Actual (Project Cost – Networks System)*

Breakdown of Cost Items	Original Estimate (At Time of Appraisal)			Actual Expenditure (PCR)		
	Foreign Currency (Mill. Yen)	Local Currency (Mill. Baht)	Total (Mill. Yen)	Foreign Currency (Mill. Yen)	Local Currency (Mill. Baht)	Total (Mill. Yen)
1. Pump Building and Related Works at Bangkhen	359	81	718			
2. Electrical Substation at Bangkhen	57	4	76			
3. Pump Equipment	1,615	41	1,795			
4. Trunk Mains	3,161	239	4,216			
5. Physical Contingency	407	34	554			
6. Tax	--	253	1,120			
7. MWA Portion	--	2,724	12,043			
Total	5,599	3,376	20,522			
(ODA Loan Portion: Mill. Yen)	(5,599)	(0)	(5,599)	(3,730)	(0)	(3,730)

Note: Exchange Rate
(Original estimate) *(Actual expenditure)*
B1 = ¥4.42 *B1 = ¥____*
(June, 1993) *(_____, _____)*
* No PCR available

(2) The PCRs report that the differences between the original estimate and the actual expenditure for both Fourth-2 and Fifth Projects were cased by (i) severe competition among contractors and (ii) fluctuation of the exchange rate. Please provide further explanation on each reason.

Fourth-2

[Severe competition among contractors]

[Fluctuation of the exchange rate]

Fifth

[Severe competition among contractors]

[Fluctuation of the exchange rate]

(B-4) Outline of Related Projects by the Government of Thailand and Other Donors

Please provide information on the outline of related projects financed by the Thai government and other donors (e.g. World Bank, Asian Development Bank), including project scope, implementation period, and project cost.

Name of Project and Donor	Project Scope	Implementation Period	Project Cost

(B-5) Land Acquisition

If the project required resettlements of local residents, please explain its implementation process. Additionally, please describe any issues and problems arisen from the resettlement and the countermeasures taken by MWA and/or other organizations.

Block C: Effectiveness (Achievement of Project Objective)

(Note) Block C examines the extent to which the project objective has been achieved by the outputs produced by the project.

(C-1) Water Production Volume: Operation Indicators

(1) Please fill in the following table to indicate the water production volume from the time of appraisal to the present (1993 – 2004). Also, kindly provide the present target figures.

Table 3-1: Water Production Volume (m^3/d) (1)

FY	Central System					Separate System	MWA Total
	Bangkhen WTP		Maha Sawat WTP		Others		
	Production	Facility Utilization Rate (%) (2)	Production	Facility Utilization Rate (%) (2)			
1993							
1994							
1995							
1996							
1997							
1998							
1999							
2000							
2001							
2002*							
2003							
2004							
Target							

* Year of project completion

(1) [Total annual production (m^3)] / 365

(2) [Total production (m^3/d)] / [Production capacity (m^3/d)] X 100

(C-2) Water Service Performance: Operation and Effect Indicators

(1) Please fill in the following table to indicate the water service performance of MWA from the time of appraisal to the present. Also, kindly provide the present target figures.

Table 3-2: Water Service Performance (MWA): Operation and Effect Indicators

FY	People Served	Water Supply Coverage (%) (1)	Per Capita Consumption (l/c/d) (2)	Water Leakage Rate (%)(3)	Unaccounted-for Water Rate (%)(4)
1993					
1994					
1995					
1996					
1997					
1998					
1999					
2000					
2001					
2002*					
2003					
2004					
Target					

* Year of project completion

(1) [Number of people served] X 100 / Total population in the service area

(2) [Total annual domestic consumption (m^3) X 1000 / 365] / [Number of people served]

(3) [Total annual leakage (m^3)] X 100 / [Total annual production (m^3)]

(4) [Total annual production (m^3) – Total annual consumption (m^3)] X 100 / [Total annual production (m^3)]

(2) Please provide the equivalent figures as above by branches or water distribution areas (especially where the project facilities were constructed) in the same format.

(C-3) Recalculation of Financial Internal Rate of Return (FIRR)

The financial internal rate of return (FIRR) is to be recalculated based on the same assumption of the JBIC appraisal report by using the data provided in this section.

Please fill in the tables below to indicate the actual as well as forecasted costs/benefits of the Fourth, Fifth, and Networks System Projects and their O&M.

FOURTH PROJECT

Table 3-3a: Recalculation of FIRR (Costs) – Fourth

No.	FY	Cost				Benefit			
		Project Cost (Mill. Baht)	Incremental O&M Cost (Mill. Baht)		Total (Mill. Baht)	Incremental Increase in Sale Qty. (m^3)	Saving in Leakage Qty. (m^3)	Average Tariff (Baht/ m^3) (1)	Total (Mill. Baht)
			Production Cost	Maintenance Cost					
-7	1993								
-6	1994								
-5	1995								
-4	1996								
-3	1997								
-2	1998								
-1	1999								
0	2000								
1	2001								
2	2002								
3	2003								
The below blanks are to be filled with forecasted/provisional figures.									
4	2004								
5	2005								
6	2006								
7	2007								
8	2008								
9	2009								
10	2010								
11	2011								
12	2012								
13	2013								
14	2014								
15	2015								
16	2016								
17	2017								
18	2018								
19	2019								
20	2020								

(1) [Total annual revenue from tariff (Baht)] / [Total annual consumption (m^3)] X 100

(1) If the actual O&M expense is more (less) than the initial estimation at the time of appraisal, please state the reasons for the discrepancy.

(2) Please state assumptions for forecast/estimate in the table above.

FIFTH PROJECT

Table 3-3b: Recalculation of FIRR – Fifth

No.	FY	Cost				Benefit			
		Project Cost (Mill. Baht)	Incremental O&M Cost (Mill. Baht)		Total (Mill. Baht)	Incremental Increase in Sale Qty. (m^3)	Saving in Leakage Qty. (m^3)	Average Tariff (Baht/ m^3) (1)	Total (Mill. Baht)
			Production Cost	Maintenance Cost					
-7	1993								
-6	1994								
-5	1995								
-4	1996								
-3	1997								
-2	1998								
-1	1999								
0	2000								
1	2001								
2	2002								
3	2003								
The below blanks are to be filled with forecasted/provisional figures.									
4	2004								
5	2005								
6	2006								
7	2007								
8	2008								
9	2009								
10	2010								
11	2011								
12	2012								
13	2013								
14	2014								
15	2015								
16	2016								
17	2017								
18	2018								
19	2019								
20	2020								

(1) [Total annual revenue from tariff (Baht)] / [Total annual consumption (m^3)] X 100

(3) If the actual O&M expense is more (less) than the initial estimation at the time of appraisal, please state the reasons for the discrepancy.

(4) Please state assumptions for forecast/estimate in the table above.

NETWORKS SYSTEM PROJECT

Table 3-3c: Recalculation of FIRR – Networks System

No.	FY	Cost				Benefit				
		Project Cost (Mill. Baht)	Incremental O&M Cost (Mill. Baht)		Total (Mill. Baht)	Incremental Increase in Sale Qty. (m^3)	Saving in Leakage Qty. (m^3)	Average Tariff (Baht/ m^3) (1)	Energy Saved (Mill. Baht)	Total (Mill. Baht)
			Production Cost	Maintenance Cost						
-7	1993									
-6	1994									
-5	1995									
-4	1996									
-3	1997									
-2	1998									
-1	1999									
0	2000									
1	2001									
2	2002									
3	2003									
The below blanks are to be filled with forecasted/provisional figures.										
4	2004									
5	2005									
6	2006									
7	2007									
8	2008									
9	2009									
10	2010									
11	2011									
12	2012									
13	2013									
14	2014									
15	2015									
16	2016									
17	2017									
18	2018									
19	2019									
20	2020									

(1) [Total annual revenue from tariff (Baht)] / [Total annual consumption (m^3)] X 100

(5) If the actual O&M expense is more (less) than the initial estimation at the time of appraisal, please state the reasons for the discrepancy.

(6) Please state assumptions for forecast/estimate in the table above.

Block D: Impact

(Note) Block D examines the extent to which the overall goals of the project have been or are expected to be achieved by the project, and also identify direct and indirect, positive and negative impacts, including socio-economic issues as a result of project implementation.

(D-1) Improvement of Water Quality

Please provide your views and comments on to what extent the project has contributed to improving the water quality in the project area. Additionally, kindly provide quantitative data to support your answer.

(D-2) Improvement of Sanitation

Please provide your views and comments on to what extent the project has contributed to improving the sanitation in the project area. Additionally, kindly provide quantitative data to support your answer.

(D-3) Enhancement of Industrial and Commercial Activities

Please provide your views and comments on to what extent the project has contributed to enhancing the industrial and commercial activities. Additionally, kindly provide quantitative information to support your answer.

Possible impacts include: change in land use, accelerated urbanization/industrialization, increase in employment opportunities, and improved accessibility to social services. Also, kindly provide specific examples of each of such impacts.

(D-4) Decrease in Ground Water Use

Please fill in the table below to indicate the amounts of ground water use and of land subsidence in the whole MWA service area as well as the project target area from the time of appraisal to the present. Additionally, kindly provide the present target figures.

Table 4-1: Ground Water Use and Land Subsidence

FY	Ground water use (thousand m^3/day)		Land subsidence (cm/year)	
	PEA Service Area	Project Area	PEA Service Area	Project Area
1993				
1994				
1995				
1996				
1997				
1998				
1999				
2000				
2001*				
2002				
2003				
2004				
Target				

* The year of the project completion

(D-5) Interview Survey to Beneficiaries

We will conduct an interview survey to the project beneficiaries, in four different locations within the project area, in order to examine the project impact, which will supplement your answer to this Questionnaire. A total of 200 interviewees from the target area will be selected for this purpose (50 from each location), in consultation with you. We will inform you of the details of the survey at a later date. Your kind understanding and cooperation to the interview survey will be highly appreciated.

(Major Items of the Interview)

a) General profile and information
b) Satisfaction level of the beneficiaries
c) Benefit/impact on daily activities
d) Benefit/impact on water quality
e) Benefit/impact on local residents (resettlement program)
f) Overall satisfaction with the project
g) Further recommendations and opinions to MWA

Etc.

(D-6) Other Impact

If there are any other positive/negative impacts (direct/indirect) that was not foreseen at the time of project appraisal, please describe them below.

Block E: Sustainability

(Note) Block E examines sustainability or self-sufficiency of the project from an institutional, financial, and technical perspective.

(E-1) O&M Agency

(1) Please provide a copy of the latest annual report and an organizational chart of the Metropolitan Waterworks Authority (MWA).

(2) According to the PCRs, the Office of the Bangkhen Water Treatment Plant and the Office of the Water Transmission and Distribution System are responsible for O&M of the project facilities. If there are any changes of the O&M section, please provide the latest information.

(E-2) Organizational Aspects of O&M

(1) Please provide an updated organizational chart of the O&M section.

(2) Please provide information (planned and actual number of staff, their composition/mobilization, and types of technical expertise) on the O&M section of the project.

(3) In relation to the previous questions, please provide your views and comments on the capacity of the O&M section in respect to the number of staff, their composition/mobilization, types of technical expertise, and organizational structure.

(E-3) Present Conditions of the Project Facilities

Please assess the present conditions of project facilities and equipment. If there are any problems, please describe the problems and explain countermeasures taken or under consideration in detail.

Table 5-1: Present Conditions of the Project Facilities

Item	Good	Fair	Poor	Very Poor
1. Bangkhen WTP				
2. Maha Sawat WTP				
3. Lad Krabang Distribution PS				
4. Klong Toey PS				
5. Lad Prao PS				
6. Pahol Yothin PS				
7. Sam Rong PS				
8. Trunk Mains				
9. Transmission Branch Conduits				

Problems:

Countermeasures taken/under consideration:

(E-4) Maintenance Program

(1) Please describe an outline of the maintenance program of the facilities procured under the project.

(2) Please fill in the table below to indicate types of maintenance activities (preventive, routine, etc.) and their scope of work and frequency. In particular, kindly give the frequency of each maintenance schedule, recommended by supplier and/or defined by the PLN.

Table 5-2: Maintenance Activities

Maintenance Activity	Scope of Work	Frequency
Preventive maintenance		
Corrective maintenance		
Breakdown Maintenance		
Overhaul/General Maintenance		

(3) Do you have any maintenance manuals or maintenance standards? If you have, please describe an outline of the manuals/standards. If not, how would you ensure an adequate level of maintenance?

(E-5) Technical Capacity and Skills regarding O&M

(1) Please state the current technical capacity and skill level of O&M staff. If the O&M section has certain benchmarks or standards to measure the technical capacity and skill level of the staff, please also provide the quantitative data or qualitative information to show the level of technical capacity and skills.

(2) If the technical capacity and skill level are not adequate and/or sufficient, what kind of countermeasures (e.g. training program) do the O&M sections plan to address these issues?

(3) Please describe the current training program in relation to O&M. In particular, kindly explain how MWA utilize the National Waterworks Technology Training Institute (NWTTI).

(E-6) Financial Capacity of O&M

(1) Please provide financial statements of MWA, including (a) balance sheets, (b) profit and loss statements, and (c) cash-flow statements in the last three financial years (if possible from the time of appraisal).

(2) Please state views and comments on the present financial conditions as well as future financial prospects of the O&M section. In particular, kindly explain what kind of problem is caused by it if the O&M budget for the project facilities and equipment is not sufficient.

(3) Please explain the latest tariff structure with the breakdown of customer categories.

Lessons Learned and Recommendations

(1) Please provide lessons learned that can be drawn from the project, which might be valuable for the future JBIC assistance or a similar type of projects.

(2) In relation to the previous question, please provide recommendations, which might be beneficial for better realization of the project effectiveness and impact, as well as assurance of sustainability.

Profile of Respondent to Questionnaire

Name:	
Organization and Title:	
TEL/FAX:	
E-mail:	
Data of Answer:	

Profile of Evaluator (Interviewer)

Name:	
Organization and Title:	
Period of Site Survey:	
TEL/FAX:	
E-mail:	
Local Contact:	
TEL/FAX:	

This questionnaire is prepared with Microsoft Word. If you need the electric file, please do not hesitate to contact us by e-mail (xxx@yyy.zz).

EVALUATION SUMMARY

Project Name: TXVII-7 Fourth Bangkok Water Supply Project (II) and Fifth Project
TXVIII-7 Networks System Improvement Project
Overall Rating: A
Evaluator: A.F. and Public Debt Management Office, Ministry of Finance
[Outline of Financing (Loan Agreement)]

TXVII-7	TXVIII-7
Loan Amount / Loan Disbursed Amount: 16,969 million yen / 11,663 million yen Date of Loan Agreement: January 1993 Final Disbursement Date: November 2002	Loan Amount / Loan Disbursed Amount: 5,599 million yen / 3,730 million yen Date of Loan Agreement: September 1993 Final Disbursement Date: January 2001

Project Outline
To cope with an increase in water demand and reduce water leakage as well as to improve water quality by constructing water treatment plants and improving distribution network systems in the Bangkok Metropolitan Area, thereby improving public health, enhancing industrial and commercial activities, and reducing use of groundwater.

Criteria	Appraisal (Plan)	Post Evaluation (Actual)	Notes
Relevance [A]	(1) The 7th National Economic and Social Development Plan (1992-1996) focused on the expansion of water supply facilities. (2) The water shortage in the Bangkok Metropolitan Area was serious; the MWA Master Plan (1990) also emphasized the expansion of the water supply facilities. (3) Aiming at expanding water production and distribution facilities in the Bangkok Metropolitan Area to address the above issues, the Projects had a high priority in the water supply sector.	(1) The 9th National Economic and Social Development Plan (2002-2006) put an emphasis on the improvement of water supply facilities. (2) There is still high demand for stable water supply (volume, pressure, and quality) in the Bangkok Metropolitan Area. (3) The Projects addresses the above issues with full regard for their importance and relevance.	Related ODA loan projects - 4th Project (I) (1991) - 6th Project (1994) - 7th Project (I) (1999) - 7th Project (II) (2000) Master Plan Prepared by Thai DCI (Thailand), Safege Consulting (France), and other Thai firms.
Efficiency [B] Output [A] Schedule [C] Cost [A]	[Output] 4th Project (II) (1) Improvement of the existing raw water canal from Sam Lae raw water PS to Bang Khen WTP (17.8 km) (2) Pumping unit at Bang Khen raw water PS (3) Lad Krabang Distribution PS with a 40,000 m^3 reservoir and a 7,500 KVA power station	[Output] 4th Project (II) (1) Cancelled (2) As planned (3) As planned (4) As planned	(1) The existing canal was later found to have sufficient conveying capacity for supplying raw water if the canal banks were raised in certain sections. MWA did this with its own

Criteria	Appraisal (Plan)	Post Evaluation (Actual)	Notes
	(4) Transmission conduits (20.5 km) (5) Trunk mains (56.7 km) (6) Distribution pipelines (600 km) (7) Rehabilitation of distribution pipelines (163 km) (8) Consulting services: a) Review of tender documents, tender evaluation; b) Construction supervision (1,662 M/M) <u>5th Project</u> (1) Maha Sawat WTP (400,000 m^3/d) (2) Trunk mains (100.9 km) (3) Distribution pipelines (1,000 km) (4) Consulting services: a) D/D for water treatment plants, review of D/D for other components; b) Construction Supervision (1,720 M/M) <u>Networks System Improvement Project</u> (1) Pumping building with a 40,000 m^3 reservoir and a 7,500 KVA power station (2) Distribution pumping units (7 units) (3) Trunk mains (130 km) (4) Distribution pipelines (370 km) (5) Consulting services: a) D/D; b) Construction Supervision (329 M/M)	(5) 18.1 km (6) 19 km (7) 310 km (8) As planned <u>5th Project</u> (1) As planned. (2) 219.5 km (3) 669.3 km (4) As planned <u>Networks System Improvement Project</u> (1) As planned. (2) 5 controlling systems added (3) 216.4 km (4) 296 km (5) As planned	resources. (2) Controlling systems at the 5 distributing PSs were additionally installed to increase the operational efficiency of pumping units.
	[Schedule] <u>4th Project (II)</u> - Jan. 1993 – Jun. 1996 (42 months) <u>5th Project</u> - Sept. 1992 – Apr. 1996 (44 months) <u>Networks System Improvement Project</u> - Sept. 1993 – Feb. 1998 (54 months)	[Schedule] <u>4th Project (II)</u> - Jan. 1993 – Jun. 2000 (90 months) <u>5th Project</u> - Jan. 1993 – Jan. 2002 (109 months) <u>Networks System Improvement Project</u> - Sept. 1993 – Jan. 2004 (125 months)	- The delays were caused by (a) delays in obtaining land permissions from BMA, (b) construction suspension caused by flooding in Nov. 1995, and (c) cash-flow problems of contractors caused by the Asian economic crisis in 1997.
	[Cost] <u>4th Project (II)</u> - ¥ 22,955 m <u>5th Project</u> - ¥ 39,084 m <u>Networks System Improvement Project</u> - ¥ 20,522 m	[Cost] <u>4th Project (II)</u> - ¥ 13,388 m <u>5th Project</u> - ¥ 20,335 m <u>Networks System Improvement Project</u> - ¥ 12,206 m	- The cost under-runs were caused by (a) intense competition among contractors and (b) fluctuation of exchange rate.

<table>
<tr><th>Criteria</th><th>Appraisal (Plan)</th><th>Post Evaluation (Actual)</th><th>Notes</th></tr>
<tr>
<td>Effectiveness [A]</td>
<td>(1) Increase in water production volume (Maha Sawat WTP) (2000 target; 2 years after the project completion)
146 mil. m^3/year

(2) Improvement of overall water service in Bangkok (2000 target; 2 years after the project completion)
a) Population Served: 8.39 mil.
b) Percentage of Population Served: 80.1%
c) Service Area: 1,060 km^2
d) Non-revenue Water Rate: 25.0%

(3) Water Quality Improvement

(4) FIRR: 4th Project (incl. 4-I) 5.35; 5th Project 4.73%; Networks System 4.54%</td>
<td>(1) Increase in water production volume (Maha Sawat WTP) (2003 actual)
125.2 mil. m^3/year (85.8% of target)

(2) Improvement of overall water service in Bangkok (2003 actual)
a) Population Served: 6.93 mil.
b) Percentage of Population Served: 87.5%
c) Service Area:1,515.5 km^2
d) Non-revenue Water Ratio:33.7%
[Beneficiary Interview Survey (N=200)]
- Water availability: 86.5% answered “largely improved” or “improved.”
- Water service stability: 85.5% answered “largely improved” or “improved.”

(3) Water Quality Improvement
- MWA’s water quality standards, which are based on WHO recommendations for international drinking water standards, have been fulfilled.
[Beneficiary Interview Survey]
- The result was that 91% answered water quality is “largely improved” or “improved.”

(4) FIRR: 4th Project (incl. 4-I) 12.77%; 5th Project 5.03%; Networks System 10.67%</td>
<td>(2) The Asian economic crisis in 1997 significantly affected the population growth trend in Bangkok Metropolitan Area (2003: forecasted 11.3 mil.; actual 7.8 mil.) and its economic and commercial activities, thereby lowering the growth rate of water demand below the original plan.
b) Percentage of population served = population served / population in responsible areas
c) The increase in outputs (trunk mains) has contributed to expanding the MWA service Areas.
d) Water leakage was once increased due to the increased water pressure caused by the increase in production. MWA is currently undertaking a NRW reduction project, targeting to reduce NRW to less than 30% by 2006.

(3) MWA (WHO) Water Quality Standards
<table>
<tr><th>Item</th><th>MWA (WHO)</th></tr>
<tr><td>E. coli</td><td>none</td></tr>
<tr><td>Color</td><td>15</td></tr>
<tr><td>Turbidity</td><td>5</td></tr>
<tr><td>Arsenic</td><td>0.01mg/l</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><th>Criteria</th><th>Appraisal (Plan)</th><th>Post Evaluation (Actual)</th><th>Notes</th></tr>
<tr><td></td><td></td><td></td><td>(4) Higher FIRR has been achieved because of (a) lower construction cost and (b) lower O&M costs.</td></tr>
<tr><td>Impact</td><td>(1) Improvement of sanitation

(2) Enhancement of industrial and commercial activities

(3) Decrease in groundwater use</td><td>(1) Decrease in acute diarrhea cases: 877.58 in 1998 to 676.98 in 2002 (per 100,000).
[Beneficiary Interview Survey]
- 18.5% responded that the project contributed to a decrease in water-born diseases.
(2) Significant contribution in the eastern part of the Bangkok Metropolitan Area: GRDP Growth in Samut Prakan Province in 2000-02 was 7.48% p.a., while the national average was 3.17% p.a.)
(3) Decrease in groundwater use: MWA groundwater use decreased from 130 mil m^3 (1993) to none in 2004. Areas which recorded land subsidence more than 3cm p.a. are largely decreased.</td><td>(3) Amendment of Groundwater Act (originally stipulated in 1977, revised in 1992 and 2003): oblige to obtain groundwater operating license, and set criteria on groundwater fee.</td></tr>
<tr><td>Sustainability
[A]</td><td>(1) Executing Agency
[Technical Capacity]
- No problems.

[Operation and Maintenance System]
- No problems.

[Financial Conditions]
- No problems (Million Baht)
<table>
<tr><th></th><th>Total Revenues</th><th>Operating Income</th><th>Net Income</th><th>Capital-Asset Ratio</th></tr>
<tr><td>1992</td><td>5,653</td><td>1,542</td><td>1,670</td><td>44.27%</td></tr>
</table></td><td>[Technical Capacity]
- No problems.

[Operation and Maintenance System]
- Important issues such as revision of water tariff are decided by MWA Board subject to approval of Minister of Interior.
- O&M is undertaken by Office of Bang Khen WTP, Office of Maha Sawat WTP, and Office of the Water Transmission and Distributing System.
[Financial Conditions]
- No problems (Million Baht)
<table>
<tr><th></th><th>Total Revenues</th><th>Operating Income</th><th>Net Income</th><th>Capital-Asset Ratio</th></tr>
<tr><td>2001</td><td>12,083</td><td>3,142</td><td>2,660</td><td>37.65%</td></tr>
</table></td><td>- O&M staff are provided training programs at NWTTI (JICA technical cooperation, 1985) and external institutions.

- Water tariff was increased three times from 1993 (effective rate: 7.17 Baht/ m^3) to 1999 (11.88 Baht/ m^3)</td></tr>
</table>

Criteria	Appraisal (Plan)	Post Evaluation (Actual)	Notes
		2002 | 12,766 | 3,613 | 3,669 | 42.98% 2003 | 13,992 | 4,200 | 3,536 | 45.71%	
	(2) Operation and Maintenance Status	(2) Operation and Maintenance Status - No problems	
Lessons Learned & Recommendations		[Lessons Learned] <u>For MWA</u> MWA should have established solid and effective communication channels with other concerned governmental agencies, such as BMA and DOH, to share information and facilitate coordination among all agencies concerned to avoid delays in project completion. [Recommendations] N/A	
Rating		- Relevance: A - Efficiency: B - Effectiveness: A - Sustainability: A - Overall Rating: A	

Fourth Bangkok Water Supply Project (II) and Fifth Project
Networks System Improvement Project

Evaluator: A. F. and Public Debt Management Office, Ministry of Finance
Field Survey: December 2004

1. Project Profile

Bangkok Metropolitan Area

Maha Sawat Water Treatment Plant

1.1 Background

In the early 1990s, the population of the Bangkok Metropolitan Area was forecast to grow from 8,073,000 in 1991 to 9,353,000 in 1996, and this growth would lead to an increase in maximum water demand from 3,460,000 m^3/day in 1992 to 4,330,000 m^3/day in 1996. As the production capacity of water supply facilities at the Metropolitan Waterworks Authority (MWA) around that time was only 3,780,000 m^3, there would be a supply-demand gap of 550,000 m^3.[5] The gap would continue to grow at 200,000 m^3 annually to be as much as 1,090,000 m^3 in 1999. In particular, the west bank area of the Chao Praya River, where the population was growing rapidly, was predicted to suffer a serious shortage of water supply, resulting in a supply-demand gap of 350,000 m^3 in 1992 and 550,000 m^3 in 1999. Commercial and industrial development as well as improvement of living standards in the Metropolitan Area would further accelerate this trend. Moreover, water transmission and distribution facilities were also decrepit and weak, causing a high proportion of non-revenue water (NRW). In addition, the Bangkok Metropolitan Area had a serious land subsidence problem because of overuse of groundwater, and there was an urgent requirement for MWA to expand its coverage area to prevent further use of groundwater.

[5] The preceding ODA loan projects for MWA included the 1st, 2nd, 3rd, and 4th (I) Water Supply Improvement Projects. Major outputs of the 4th Project (I) (L/A: September 1991; disbursed amount: 5,849 million yen) were (i) siphons at the raw water canal, (ii) water treatment facilities at Bang Khen water treatment plant, (iii) pumping units at transmission pumping stations, and (iv) transmission and distribution pipelines.

1.2 Objective

The objectives of the projects were to cope with increasing water demand and reduce water leakage as well as to improve water quality by constructing water treatment plants and improving distribution network systems in the Bangkok Metropolitan Area, thereby contributing to improving public health, enhancing industrial and commercial activities, and reducing use of groundwater.

1.3 Borrower/Executing Agency

Metropolitan Waterworks Authority/Metropolitan Waterworks Authority

1.4 Outline of Financing (Loan Agreement)

	Fourth Bangkok Water Supply Project (II) and Fifth Project	Networks System Improvement Project
Loan Amount Loan Disbursed Amount	16,969 million yen 11,663 million yen	5,599 million yen 3,730 million yen
Date of Exchange of Notes Date of Loan Agreement	December 1992 January 1993	September 1993 September 1993
Terms and Conditions Interest Rate Repayment Period (Grace Period) Procurement	 3.0% p.a. 25 years (7 years) General Untied	 3.0% p.a. 25 years (7 years) General Untied
Final Disbursement Date	November 2000	January 2001
Contractors	Obayashi Corporation (Jpn.) Kawasho Corporation (Jpn.) Other Thai Firms	Kubota Corporation (Jpn.) Other Thai Firms
Consultants	Nihon Suido Consultants (Jpn.) Safege Consulting (Fr.) Other Thai Firms	--
Project Planning (F/S)	--	--

2. Results & Evaluation

2.1 Relevance

2.1.1 Relevance at the time of appraisal

Thailand's 7th National Economic and Social Development Plan (NESDP) (1992-1996) emphasized the importance of expanding the city's water supply facilities and reducing water leakage. Corresponding to a serious water shortage at that time, MWA proposed the expansion of water supply facilities in its master plan prepared in 1990.[6]

[6] The master plan, "Master Plan for Water Supply and Distribution of Metropolitan Bangkok," was prepared by the Thai DCI in association with Southeast Asia Technology, the Team Consulting Engineers, and the Safege Consulting.

Hence, the subject projects had a high priority, as these projects aimed at expanding water production and distribution facilities in the Metropolitan Area to address these problems.

2.1.2 Relevance at the time of ex-post evaluation

The present 9th NESDP (2002-2006) also argues a priority need for improving water supply facilities. Significant needs for stable water supply services still remain, particularly for improvements in volume, pressure, and quality. Thus, the projects continue to hold importance and relevance to address these issues.[7]

2.2 Efficiency

2.2.1 Outputs

A comparison between the planned outputs at appraisal and the actual outputs at ex-post evaluation shows that most of the major components were implemented as planned with only slight variations (see Table 1 and Figure 1).

In the 4th Water Supply Improvement Project (II) (4th Project (II)), the improvement of the existing canal was cancelled because the canal was later found to have sufficient conveying capacity if some sections of canal banks were raised. This bank raising was conducted through the maintenance activities of MWA. Moreover, in the Network Systems Improvement Project (Network Systems Project), five controlling systems at distribution pumping stations were additionally installed to enhance the operational efficiency of pumping units.

On the other hand, in all the three projects, the pipeline components, such as transmission conduits, trunk mains, and distribution pipelines were modified. The reasons for the modifications were (i) to cope with the increasing water demand in newly expanded service areas, (ii) to adjust to specific conditions of project sites, and (iii) to coordinate with other governmental agencies such as the Bangkok Metropolitan Administration (BMA) and the Department of Highways (DOH).

These modifications made in the course of implementation were reasonable and did not affect the overall efficiency of the project implementation.

[7] The 7th Water Supply Improvement Project (1999-2006), partially financed by JBIC, is currently being implemented.

Table 1: Appraisal Plans & Actual Performance (Outputs)

Phase	Plan	Actual	Reason of modifications
4th Project (II)	(1) Improvement of the existing raw water canal from Sam Lae raw water PS to Bang Khen WTP: 17.8 km	(1) Cancelled	(1) The existing canal was later found to have sufficient conveying capacity for supplying raw water if the canal banks were raised in certain sections. MWA did this with its own resources.
	(2) Pumping unit at Bang Khen raw water PS: 348 m^3/m	(2) As planned	
	(3) Lad Krabang Distribution PS: 111 m^3/m; Power station: 7,500 KVA	(3) As planned	
	(4) Transmission conduits: 20.5 km	(4) As planned	
	(5) Trunk mains: 56.7 km	(5) 18.1 km	
	(6) Distribution pipelines: 600 km	(6) 819 km	
	(7) Rehabilitation of distribution pipelines: 163 km	(7) 310 km	
	(8) Consulting services: a) Review of tender documents, tender evaluation; b) Construction supervision (1,662 M/M)	(8) As planned	
5th Project	(9) Maha Sawat WTP: 400,000 m^3/d	(1) As planned	
	(10) Trunk mains: 109.5 km	(2) 219.5 km	
	(11) Distribution pipelines: 1,000 km	(3) 669.3 km	
	(12) Consulting services: a) D/D for water treatment plants, review of D/D for other components; b) Construction Supervision (1,720 M/M)	(4) As planned	
Network Systems Project	(1) Pumping building; Reservoir: 40,000 m^3; Power station: 7,500 KVA	(1) As planned	(2) Controlling systems at the 5 distributing PSs were additionally installed to increase the operational efficiency of pumping units.
	(2) Distribution pumping units: 7	(2) 5 controlling systems added	
	(3) Trunk mains: 130 km	(3) 216.4 km	
	(4) Distribution pipelines: 370 km	(4) 296 km	
	(5) Consulting services: a) D/D; b) Construction Supervision (329 M/M)	(5) As planned	

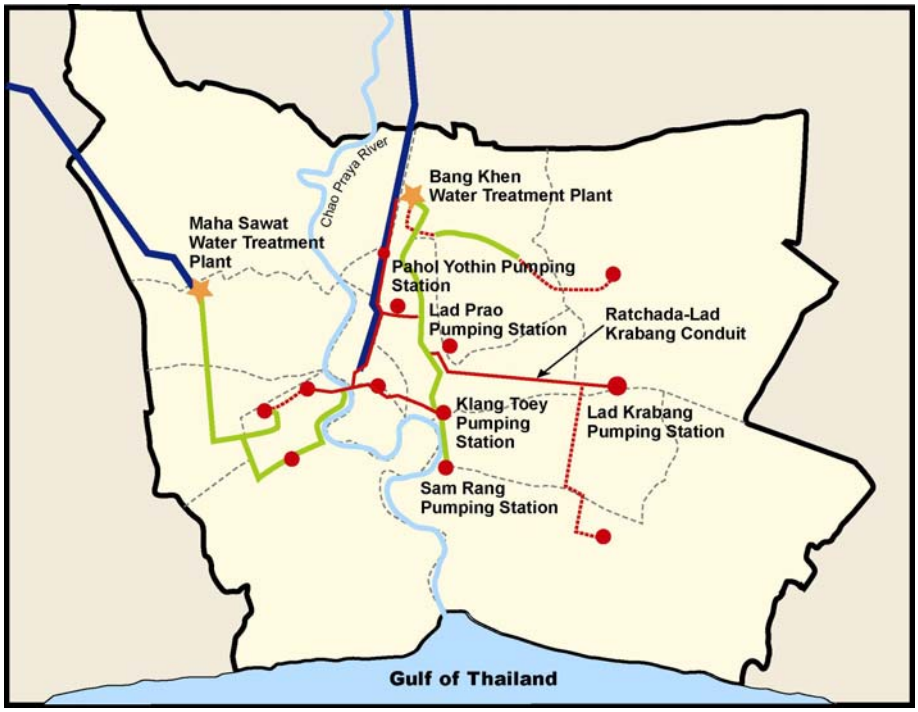

Fig. 1: Project Site Map (Actual)

2.2.2 Project Period

Table 2 presents a comparison between the planned project period at appraisal and the actual project period at ex-post evaluation. The pipeline components were greatly delayed, while the water production components were completed on time. The delays were primarily attributable to (i) delays in obtaining construction permissions from BMA, (ii) flooding in November 1995, and (iii) cash-flow problems of contractors due to the Asian economic crisis in 1997.

Table 2: Appraisal Plans & Actual Performance (Project Period)

Phase	Plan	Actual
4th Project (II)	January 1993 – June 1996 (42 months)	January 1993 – June 2000 (90 months)
5th Project	September 1992 – April 1996 (44 months)	September 1992 – January 2002 (113 months)
Network Systems Project	September 1993 – February 1998 (54 months)	September 1993 – September 2004 (133 months)

2.2.3 Project Cost

Table 3 shows a comparison between the planned project cost at appraisal and the actual project cost at ex-post evaluation. In all the three projects, the actual project costs were within the initial budgets. These cost under-runs were primarily a result of (i) intense competition among contractors during the tender and (ii) depreciation of local

currency.

Table 3: Appraisal Plans & Actual Performance (Project Cost) (¥ million)

Phase	Plan			Actual		
4th Project (II)	¥ 22,955	Foreign	¥ 8,066	¥ 13,388	Foreign	¥ 6,440
		Local	¥ 14,889		Local	¥ 6,948
5th Project	¥ 39,084	Foreign	¥ 16,017	¥ 20,335	Foreign	¥ 5,057
		Local	¥ 23,067		Local	¥ 15,278
Network Systems Improvement Project	¥ 20,522	Foreign	¥ 5,599	¥ 12,206	Foreign	¥ 3,319
		Local	¥ 14,923		Local	¥ 8,887

2.3 Effectiveness

2.3.1 Increase in Production Volume

As indicated in Figure 3, since its start in 1996, the Maha Sawat water treatment plant has operated effectively at an operation rate of more than 70% on average.[8] The water production volume in 2003 reached as much as 85.8% of the planned figure. In 2000, the subsequent 6th Water Supply Improvement Project further increased the production capacity by 400,000 m^3/day.

Fig. 2: Filter at Maha Sawat Water Treatment Plant

In 2003, the Maha Sawat water treatment plant treated 14.5% of the total MWA water production. The establishment of the Maha Sawat water treatment plant has made an extremely important change to the entire MWA system, as it reduces the dependence on the Bang Khen water treatment plant and serves the western part of the Bangkok Metropolitan Area.

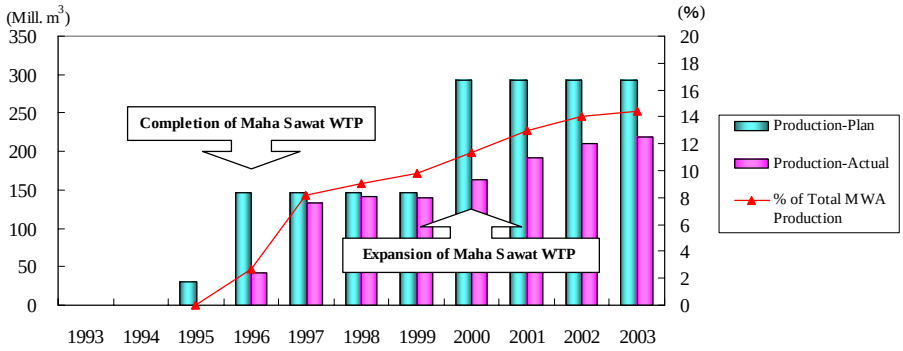

Fig. 3: Appraisal Plans & Actual Performance (Water Production Volume) (Source: MWA)

2.3.2 Improvement in Water Supply Services in Bangkok Metropolitan Area

As Table 4 presents, MWA has improved its overall water supply services since the beginning of the projects in 1993. However, the actual figures of population served and total water sales have fallen below the original plan, largely because the Asian economic

crisis negatively affected the population growth trend (2003: forecast 11.3 million; actual 7.8 million) as well as commercial and industrial activities in the Bangkok Metropolitan Area. Meanwhile, the fact that the percentage of the population served and service area have exceeded the plan indicates that MWA has successfully expanded its service capacities even under unfavorable socioeconomic conditions.

Table 4: Appraisal Plans & Actual Performance (Water Supply Services)

FY	Project Implementation Period*			Population Served (000)		Percentage of Population Served (%)		Service Area (km^2)		Total Water Sales (mill. m^3)	
	4	5	NS	(Plan)	(Actual)	(Plan)	(Actual)	(Plan)	(Actual)	(Plan)	(Actual)
1993				6,559.0	5,583.0	76.4	77.7	780.0	784.4	965.8	836.1
1994				6,790.0	5,792.0	76.8	80.0	810.0	822.3	1,071.0	816.1
1995				7,023.0	5,959.0	77.2	82.2	850.0	892.9	1,178.5	870.3
1996				7,258.0	6,124.0	77.6	83.7	890.0	968.9	1,171.6	911.2
1997				7,495.0	6,307.0	78.0	85.7	940.0	1,096.4	1,193.1	944.7
1998				7,789.0	6,369.0	78.7	85.6	1,000.0	1,129.3	1,334.3	914.8
1999				8,088.0	6,232.0	79.4	85.3	1,030.0	1,148.4	1,352.3	856.6
2000				8,390.0	6,345.0	80.1	84.2	1,060.0	1,242.7	1,445.4	880.3
2001				8,697.0	6,500.0	80.8	85.3	1,090.0	1,279.5	1,445.4	929.5
2002				9,007.0	6,703.0	81.5	86.9	1,120.0	1,448.8	1,554.9	969.4
2003				9,322.0	6,931.0	82.2	87.5	1,150.0	1,515.1	1,554.9	1,013.9

* 4 = 4th Project; 5 = 5th Project; NS = Network Systems Project

(Source: MWA)

On the other hand, the planned targets for non-revenue water (NRW) ratio have not been achieved (Figure 4). The NRW ratio increased dramatically from 31.9% in 1993 to 43.1% in 1997 because water production volume had increased and consequently raised water pressure in the pipelines. From the peak level in 1997, however, MWA has managed to decrease NRW through a number of measures, including the pipeline components of the projects as well as the recent Water Loss Improvement Project (2002-2005).[9]

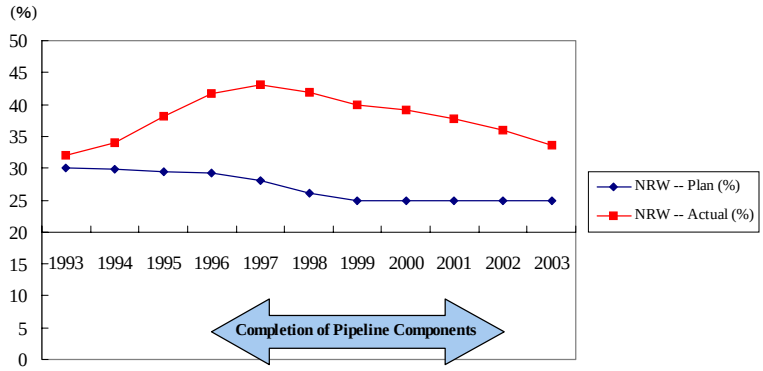

Fig. 4: Appraisal Plans & Actual Performance (Non-revenue Water Ratio) (Source: MWA)

[8] Operational rate = average daily production / facility capacity x 100

[9] The project aims at reducing NRW ratio to less than 30% by 2006. Specific measures include improvement of distribution facilities and introduction of automatic control system with IT enhancement.

The results of the beneficiary survey show that the beneficiaries of the projects are generally satisfied with the changes that the projects have brought about (see Figure 5).[10] The proportion of interviewees who answered “largely improved” or “improved” was 86.5% when referring to water availability and 85.5% when referring to water stability.

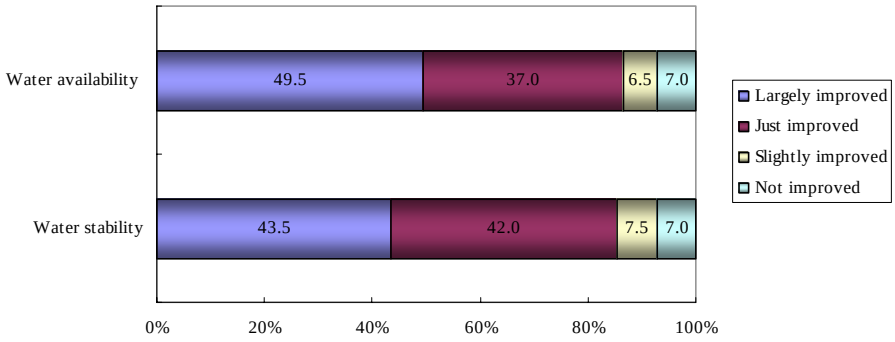

Fig. 5: Beneficiary Interview Survey (Improvement of Water Supply Services) (N=200)

It should be noted that these improvements have become possible with the implementation of other water supply sector projects such as the West Bank Raw Water Canal Project (1993-2002), the Pipe Networks System Improvement Project (1994-2003), the 6th Water Supply Improvement Project (1995-2006) and the 7th Project (1999-2006).

2.3.3 Improvement in Water Quality

The subject projects have also contributed to improving the water quality of MWA. The water quality currently satisfies set standards, which are based on the 1993 WHO recommendations on international drinking water standards (see Table 5).

Table 5: Water Quality Standards of MWA

Item	MWA
Escherichia coli	None
Color	15
Turbidity	5
Arsenic	0.01mg/l

(Source: MWA)

This is also evidenced by the fact that 91.0% of the interviewees in the beneficiary interview surveys evaluated water quality as “largely improved” or “improved”.

[10] The beneficiary interview survey was undertaken as a part of this evaluation to measure the contribution of the subject projects to improving the MWA water supply services and subsequently the environment in the Bangkok Metropolitan Area. In each of four selected areas, 50 interviewees were randomly chosen. The interview locations included Bangkok Outer Ring Road and Lad Krabang from the 4th and 5th projects as well as Phahol Yothin and Srinakarindra from the network systems project. These locations were chosen in thorough consultation with MWA.

2.3.4 Financial Reevaluation

The recalculated financial internal rates of return (FIRRs) of the 4th Project, 5th Project, and the Networks System Project are 12.8%, 5.0%, and 10.7%, respectively (Table 6).[11] These figures surpass the expected FIRRs at appraisal, primarily because of (i) the decrease in project costs and (ii) decrease in operation and maintenance (O&M) costs due to the enhancement of operational efficiency by reducing personnel (i.e. increase in the customer to employee ratio) and introducing IT.

Table 6: Appraisal Plans & Actual Performance (FIRRs)

Phase	Plan	Actual
4th Project	5.4%	12.8%
5th Project	4.7%	5.0%
Networks System Project	4.5%	10.7%

2.4 Impacts

2.4.1 Improvement in Sanitation

The Bangkok Metropolitan Area had long suffered from poor sanitation and, consequently, a high incidence of waterborne disease. Even though the results of the beneficiary survey do not clearly indicate that the beneficiaries are aware of the projects' contribution, the cases of acute diarrhea per 100,000 people decreased from a peak level of 877.58 in 1998 to 676.98 in 2002.[12]

The beginning of this trend coincides with the implementation of trunk main and distribution pipeline improvement, and it is therefore suggested that the projects have assisted in improving sanitary conditions in the Bangkok Metropolitan Area.

2.4.2 Enhancement of Commercial and Industrial Activities

The subject projects also appear to have enhanced commercial and industrial activity in the Bangkok Metropolitan Area. In particular, positive impacts on economic and commercial activities have been evident in the areas where the Lad Krabang distribution pumping station was constructed under the 4th Project. The average annual GRDP growth rate from 2000 to 2002 in this area was 7.48%, more than double the national average of 3.17%.

Fig. 6: Lad Krabang Pumping Stations

[11] The FIRR calculations performed at appraisal took costs to be construction costs and O&M costs (for all the projects), and benefits to be the incremental increase in revenue from water sales (for all the projects) and reduction in water loss (4th Project and Network Systems Project only) as well as savings in energy consumption (for Network Systems Project only). The recalculations of this evaluation use the same terms. It should be noted that these evaluations of the 4th Project cover both the phase I and the phase II.

[12] 18.5% of the interviewees answered "Yes" to the question asking if the Projects have decreased waterborne disease in neighborhood, while 4.5% said "No" and 77.0% "Don't know."

2.4.3 Reduction of Groundwater Use

As shown in Table 7, the use of groundwater has decreased since the mid-1990s from 238,400 m^3/day to none in 2004. This is primarily because (i) several MWA projects, especially the networks system project, have expanded the area served by the central system, and (ii) the government amended the Groundwater Act in 2003 to tighten the enforcement of rules on groundwater use. The areas with land subsidence of more than 3 cm/year have significantly reduced.

Table 7: Groundwater Use in Bangkok Metropolitan Area (1000 m^3/day)

1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
120.3	191.8	238.4	251.8	214.3	109.3	21.0	24.0	12.0	11.4	7.1	0.0

(Source: MWA)

2.5 Sustainability

2.5.1 Executing Agency

2.5.1.1 Technical Capacity

The technical capacity of MWA is strong enough to ensure the sustainability of the project effectiveness. In order to further enhance the technical capabilities of each employee, MWA provides a range of training programs at the National Waterworks Technology Training Institute (NWTTI) and external institutions.[13] Moreover, MWA seeks to improve its managerial capacity by obtaining ISO 9001 certification and other measures.

2.5.1.2 Operation and Maintenance System

The responsibility for O&M of the facilities and equipment under the subject projects lies with several departments under the Deputy Governor of Production and Transmission, which include the Office of Bang Khen Water Treatment Plant, Maha Sawat and Thon Buri Water Treatment Plant Department, and the Office of Water Treatment and Distribution Systems (see Figure 7).

The Board of Directors makes important decisions, such as on changes to water prices, in consultation with the Ministry of Interior.[14]

[13] NWTTI was established through the receipt of technical cooperation from the Japan International Cooperation Agency (JICA) in 1989.

[14] The tariff structure of MWA is different between domestic and business/governments users. Both types have proportional tariff classifications according to consumption amount with the minimum rate of 8.50 Baht/m^3 (23.3 Yen) for domestic users and 9.50 Baht (26.0 Yen) for business/government users. Minimum tariffs for domestic users are 0.75 Ringgit (20.0 Yen) for domestic users and 1.80 Ringgit (51.4 Yen) for industrial and commercial users in Kuala Lumpur, and 1,335 Rupiah (15.2 Yen) for domestic users and 5,200 Rupee (59.4 Yen) for commercial and industrial users in Jakarta.

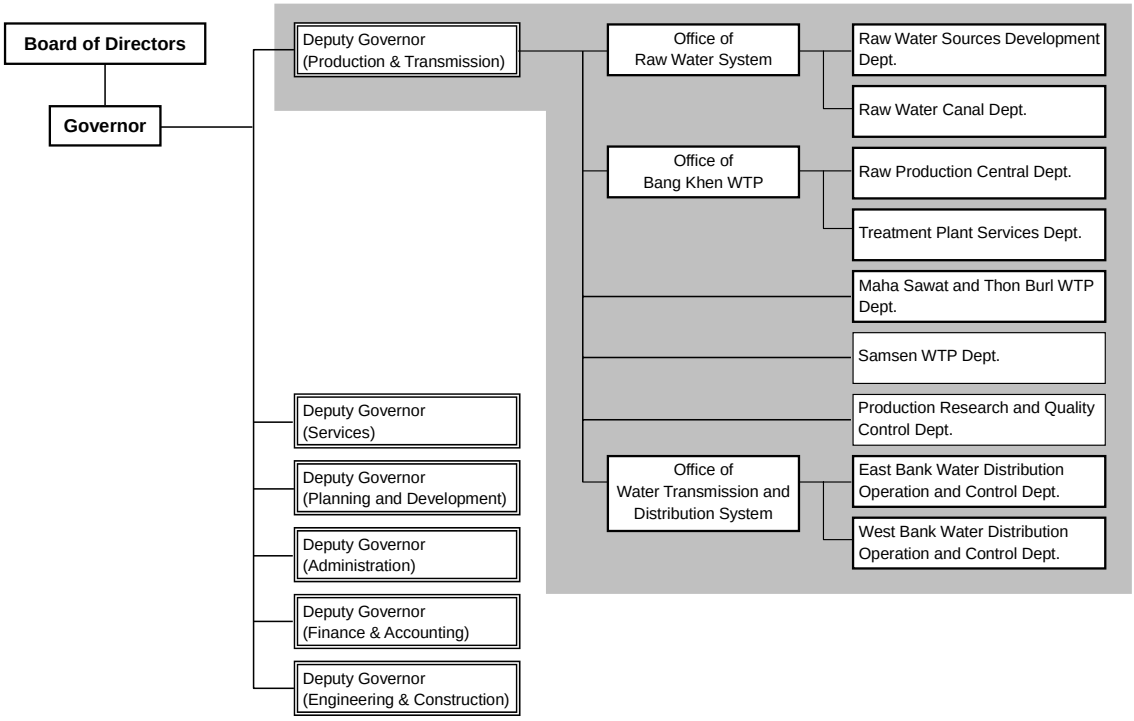

Fig.7: O&M Organizational Chart

2.5.1.3 Financial Status

Table 8 indicates the key financial indicators of MWA for the past three years. Overall, the financial status has been stable with a net income ratio of over 20% and an equity to capital ratio of over 40%, levels that should ensure the sustainability of the project facilities. Price increases in 1997, 1998, and 1999 raised the MWA's effective rate from 7.14 Baht/m^3 in 1994 to 11.88 Baht/m^3, and this has contributed to the financial performance.

Table 8: Key Financial Indicators

FY	Total Revenues (Mill. Baht)	Operating Income (Mill. Baht)	Net Income (Mill. Baht)	Equity to Capital Ratio (%)
1992	5,653	1,542	1,670	44.3
2001	12,083	3,142	2,660	37.7
2002	12,766	3,613	3,669	43.0
2003	13,992	4,200	3,536	45.7

(Source: MWA)

2.5.2 Operation and Maintenance Status

The O&M status of the project facilities constructed through the projects is generally favorable.

3. Feedback

3.1 Lessons Learned

For MWA

MWA should have established solid and effective communication channels with other concerned governmental agencies, such as BMA and DOH, to share information and facilitate coordination among all agencies concerned to avoid delays in project completion.

3.2 Recommendations

None.

Comparison of Original & Actual Scope

Items	Planned	Actual
(1) Outputs		
- 4th Bangkok Water Supply Improvement Project (II)	• Improvement of the existing raw water canal: 17.8 km	• Cancelled
	• Pumping unit at Bang Khen raw water PS: 348 m^3/m	• As planned
	• Lad Krabang Distribution PS	• As planned
	• Transmission conduits: 20.5 km	• As planned
	• Trunk mains: 56.7 km	• 18.1 km
	• Distribution pipelines: 600 km	• 819 km
	• Rehabilitation of distribution pipelines: 163 km	• 310 km
	• Consulting services: 1,662 M/M	• As planned
- 5th Bangkok Water Supply Improvement Project	• Maha Sawat WTP: 400,000 m^3/d	• As planned
	• Trunk mains: 109.5 km	• 219.5 km
	• Distribution pipelines: 1,000 km	• 669.3 km
	• Consulting services: 1,720 M/M	• As planned
- Networks System Improvement Project	• Pumping building; Reservoir: 40,000 m3; Power station: 7,500 KVA	• As planned
	• Distribution pumping units: 7	• 5 controlling systems added
	• Trunk mains: 130 km	• 216.4 km
	• Distribution pipelines: 370 km	• 296 km
	• Consulting services: 329 M/M	• As planned
(2) Project period		
- 4th Project (II)	Jan. 1993 – Jun. 1996	Jan. 1993 – Jun. 2000
- 5th Project	Sept. 1992 – Apr. 1996	Sept. 1992 – Jan. 2002
- Networks System Improvement Project	Sept. 1993 – Feb. 1998	Sept. 1993 – Sept. 2004
(3) Project cost		
- 4th Project (II)		
Foreign currency	8,066 million yen	6,440 million yen
Local currency	14,889 million yen	6,948 million yen
Total	22,955 million yen	13,388 million yen
Japan's ODA loan	8,836 million yen	6,541 million yen
Exchange rate	¥1 = B 0.196 (June 1992)	¥1 = B 0.399 (Weighted average for execution period)
- 5th Project		
Foreign currency	16,017 million yen	5,057 million yen
Local currency	23,067 million yen	15,278 million yen
Total	39,084 million yen	20,335 million yen
Japan's ODA loan	8,133 million yen	5,122 million yen
Exchange rate	¥1 = B 0.196 (June 1992)	¥1 = B 0.370 (Weighted average for execution period)
- Networks System Improvement Project		
Foreign currency	5,599 million yen	3,319 million yen
Local currency	14,923 million yen	8,887 million yen
Total	20,522 million yen	12,206 million yen
Japan's ODA loan	5,599 million yen	3,730 million yen
Exchange rate	¥1 = B 0.226 (June 1993)	¥1 = B 0.379 (Weighted average for execution period)

V. PERFORMANCE MONITORING INDICATORS

Performance indicators are criteria for evaluating the performance of activities with certain objectives; in public sector, performance of various types of interventions such as public policies, services and development projects, etc. “Setting up performance indicators and their target values for policies and projects during the planning stage, and collecting actual indicator values to evaluate to what extent the original targets were achieved” is called performance measurement. It is becoming popular as an effective administrative management tool around the world. In the case of Thailand, use of “Key Performance Indicators (KPI) of public institutions” is an example of applying performance indicators, though the operational status is not known to us yet.
This section tries to briefly explain the project performance indicators, its broad definitions in the World Bank and JBIC. Then, it is discussed how they will be developed suitable to PDMO’s use.

1 Performance Indicators in Development Project Evaluation

It is often cited that the objectives of evaluating performance are 1) to improve future project implementation more effectively through learning lessons, and 2) to ensure accountability by demonstrating the state of implementation and its effects. Performance indicators are defined as a set of indicators to quantify input, output, outcome and impact of development project or program. In the project design matrix (PDM), these indicators are put in columns 2 and 3.

The following common characteristics, among others, can be observed in the ways performance indicators are used in development projects;

- First, the hierarchical cause and effect relationships are defined between inputs, activities, outputs, outcomes and impacts.
- Within that hierarchy, the emphasis is not confined to monitoring “what did the project do?” in the input-output range, but extends to “what were the results of what the project did, and what did the project change for beneficiaries and the target economy and society”.
- Baseline data are defined and collected before the project begins, and data collection continues consistently through project implementation and on to the ex-post stage.

Performance indicators are used primarily in the monitoring of projects, and then the project performance data collected continuously from the start of a project is also the central basis for judgments at the ex-post evaluation stage. Performance indicators give an objective indication of whether or not the project achieved its objectives, as well as what it did.

The following indicates general criteria for setting appropriate indicators.

- Validity: Are the set indicators really able to measure the achievement of project purpose?
- Reliability: Will the set indicators yield the same results, regardless of who measures?
- Ease of access: Will it be easy to access the indicator data set for the project? Are there too many indicators, considering the cost and time required to gather them?

2 Types of Indicators - World Bank, JBIC and PDMO

(1) The World Bank

Types of performance indicators used by the World Bank are as follows;

Definitions of performance indicators

- Results indicators: Indicators to measure the results of a project. Also known as direct indicators.
  - Input indicators: Indicators to measure the resources input in order to carry out project activities (e.g. funds, personnel, quantities and usage of equipment and materials)
  - Output indicators: Indicators to measure the goods and services produced from the project inputs (e.g. total length of roads built, numbers of people vaccinated).
  - Outcome and impact indicators: Indicators to measure social and economic changes (outcomes) produced by the goods and services provided by the project (e.g. increase in traffic volume, reductions in disease due to vaccinations).
  - Relevance indicators: These indicators measure the influence of project impacts and outcomes on higher-order or wider-ranging policy tasks (e.g. economic progress due to reduced transport costs, achievement of national health targets).
- Risk indicators: These indicators measure the degree of risk manifestation,

which has a strong impact on the success or failure of the project.

- Efficacy indicators: Indicators that measure the degree to which achievement of objectives on one level lead to achievement of objectives on the next level.
  - Efficiency indicators: The ratio of inputs to the outputs generated by the project.
  - Effectiveness indicators: The ratio of outputs (or inputs) to outcomes and impacts (e.g. number of vaccinations or vaccine cost per unit reduction in disease incidence rates, number of kilometers of road construction per unit increase in vehicle usage rate).
  - Sustainability indicators: The level of long-term sustainability of the project (e.g. movements in disease incidence rates after the end of a vaccination project, road maintenance condition after the completion of construction).

(2) JBIC

JBIC introduced operation and effect indicators in 2000 as performance indicators to enable project monitoring and evaluation on the basis of consistent indicators used from the ex-ante to ex-post stages. Operation and effect indicators are defined as follows. They are both basically equivalent to outcome indicators among the performance indicators used by the World Bank.

- **Operation indicator**: An indicator to measure, quantitatively, the operational status of a project; the degree of operation of outputs
- **Effect indicator**: An indicator to measure, quantitatively, the effects generated by a project; the extent of effects on the beneficiaries or target region

At the appraisal stage, JBIC staff, in consultation with the counterpart executing agency, selects suitable indicators for the project concerned. The table below lists typical operation and effect indicators for several sectors. For some of them it is hard to define whether they are operation indicators or effect indicators. Flexible categorization on these should be made for each individual project.

Sample of Operation and Effect Indicators

Sector name	Typical Operation indicators (units)	Typical effect indicators (units)
Irrigation	Actual irrigated area (ha)	Production volume of major crops (tons)
Electricity generation	Utilization factor (%)	Net electric energy production (kWh)
Flood control	Annual highest water level (m)	Annual maximum inundated area by levee breach or overflow (km^2)
Water supply	Water supply volume (m^3/day)	Percentage of served population (%)
Port	Freight volume (ton or TEU/year)	Reduction in average waiting time (minutes)
Road	Annual average traffic volume (no. of vehicles/day)	Reduction in transport times (hours/year)

(3) PDMO's Project Performance Indicators

There is a variety of performance indicators used in development projects. It may not be difficult to prepare guidelines for performance indicators by studying available reference materials of donor institutions. The following table shows the common indicators used in water supply sector. Depending PDMO's sector priority, these standard set of indicators may be developed for other sectors too in consultation with relevant authorities. When selecting standard set of performance indicators, validity, reliability, and easy to access have to be ensured. Then, the indicators should be carefully selected as an application to a specific project, depending on scope and objectives of project. Selection of indicators and target setting may be a job of project implementing agency, and the important task of PDMO may be enforcement of periodical collection and reporting of data to PDMO as agreed. Without such an institutional arrangement, the intended outcome of Performance Indicator System would not be realized.

3. Sample Indicators of Major Sectors

After the project ex-post evaluation of JBIC in 2003 and 2004, JBIC provided ex-post monitoring sheets for each project to monitor the operational and effect performance for the next five years. While ex-post evaluations of these projects were studied by PDMO, the team together with JICA experts learned the sector specific performance indicators related to these sectors. These projects include in the sectors of;

1. De-sulfurization for Thermal Power Plant
2. Telecommunications
3. Education (technical training)
4. Water Supply
5. Electricity Distribution
6. Roads
7. Tourism

The sample indicators found/learned are as following tables.

Desulfurization Device for Thermal Power Generation

Name	Definition	Target		Purpose
SOx Emission Concentration at Rated Output (ppm or mg/m^3)	As shown by the name of the indicator	Within the standard range		To assess desulfurization achievement and the conditions for maintaining performance
SOx Removal Efficiency (%)	= (1 - amount emitted from the funnel / amount emitted from the boiler) × 100	Value designed		To assess the conditions for maintaining performance
Desulfurization Availability to Generator Operation Hours (%)	= (Operating hours per year/hours per year) × 100	Almost 100%		To confirm the adequacy of the original operation plan
Outage Hours for Every Cause (Hours/Year or Days/Year)	As shown by the name of the indicator	Human error	0	To check this as the operating condition of the plant
		Machine trouble	Discussion	
		Planned outage	Regular inspection	
Outage Times for Every Cause (Times/ Year)	As shown by the name of the indicator	Human error	0	To check this as the operating condition of the plant
		Machine trouble	Discussion	
		Planned outage	Regular inspection	

Name	Definition	Target	Purpose
Amount of SOx Reduction (t/Year)	= Amount emitted from the boiler - amount emitted from the funnel	Refer to the remarks	To assess desulfurization achievement
Amount of Dust Reduction (t/Year)	= Amount at the EP outlet - amount emitted from the funnel	Refer to the remarks	To assess collateral effect of desulfurization

Electricity Distribution

Name [*1]	Definition	Target	Purpose
Peak Load (kW)	Maximum electricity in a certain area (adopted for supplying work)	Predicted values by F/S, etc.	To grasp the degree of improvement in power supply capacity
System average interruption duration index (Min/Year)	Cumulative outage hours per year (minutes)/ Number of end-users (households) (Adopted for repair work)	0, in principle	To grasp the degree of reduction in number of accidents To grasp the degree of reduction in the hours for which interruption lasts

Name [*1]	Definition	Target	Purpose
Electrification Rate of Households (%)	Number of households electrified × 100/ number of total households (Adopted for supplying work)	100% in principle	To grasp the increased demand
Sales Volume (MWh)	As shown by the name of indicator (Adopted for supplying work)	Predicted values by F/S, etc.	To grasp the increased demand
Distribution Loss (%)	Distribution loss (kWh) × 100/ Electricity transmitted (kWh) (Adopted for supplying work)	Several percent	To grasp the degree of distribution loss reduction
Index of Progress of Distribution Network Automation	Set the indicator appropriately considering the staff who engage in the maintenance of distribution cables (number of persons) and personnel costs. (Adopted for automation work of distribution)	Predicted values by F/S, etc.	To grasp the degree of reduction in the number of staff and personnel cost

*1: Indicator is set in every target area of the project.

*2: When works cover the transmission and transformation facility portion (installing transmission wires in the section from transmission transformer station to distribution transformer, and constructing of distribution transformer station), adoption of the operation indicators that are originally for the transmission and transformation project is applied to that portion separately.

*3: In many cases in this sector, project target areas correspond with administrative districts. However, when they do not correspond with administrative districts, or when the electrification rate of households is difficult to obtain, adoption of the rural electrification rate of households is considered in order to assess the contribution of the electrification rate to the percentage change in the administrative district that includes the project's target area.

Roads

Name	Definition	Target	Purpose
Annual Average Daily Traffic (AADT) --Vehicles/Day or Vehicles/12 Hours	Annual average daily traffic at a certain point, or at a representative point of the whole section, or distance-weighted mean annual traffic Total number of full-size cars, compact cars, etc., or Passenger Car Unit (PCU) is used for counting volume of traffic. The duration is represented basically by units of days (24 hours). Representing the duration by 12-hour units is also acceptable.	To be discussed with the executing agency	To assess if the road transport demand is increasing as predicted, or if adequate traffic conversion is implemented

Name	Definition	Target	Purpose
Annual Average Daily Traffic (AADT) --Vehicles/Day or Vehicles/12 Hours	Annual average daily traffic at a certain point, or at a representative point of the whole section, or distance-weighted mean annual traffic Total number of full-size cars, compact cars, etc., or Passenger Car Unit (PCU) is used for counting volume of traffic. The duration is represented basically by units of days (24 hours). Representing the duration by 12-hour units is also acceptable.	To be discussed with the executing agency	To assess if the road transport demand is increasing as predicted, or if adequate traffic conversion is implemented
Time Saving (Time, Yen (or Local currency))/ Year	According to measurement survey on time required Basically, time units are adopted, but adopting monetary terms is also acceptable.	To be discussed with the executing agency	To assess the degree of reduction in driving time, comparing the road after development with that before development
Vehicle Operation Cost Saving (Yen or Local currency/ Year)	According to some values used for EIRR computation as well as the standards of the country	To be discussed with the executing agency	To assess the degree of reduction in vehicle operation cost, comparing the road after development with that before development
Average Velocity Increase (km/h)	Worked out using the above mentioned time required and the distance before and after the development	To be discussed with the executing agency	Worked out using the above mentioned time required and the distance before and after the development
Number and Frequency of Traffic Accidents (Accidents/10,000 Vehicles, km, Number of accidents, Casualties, Yen (or Local currency))	Worked out using statistics on traffic accidents compiled by public safety agencies Monetary terms can be adopted when amount of human cost and property damage per accident are set.	To be discussed with the executing agency	To assess the change in number of traffic accidents after the road development compared with before the development

Name	Definition	Target	Purpose
Congestion Length Decrease and Time Saving (m, Hours)	According to the measurement survey on congestion length and time required at the peak time	To be discussed with the executing agency	To assess the degree of reduction in congestion length and time required to pass after the road development compared with before the development
Decrease of Annual Traffic Impassability Dates Due to Disaster (Days/ Year)	According to the statistics compiled by the road administrator	To be discussed with the executing agency	To assess the degree of reduction in annual traffic impassability dates after the road development compared with before the development

Telecommunications

Name	Definition	Target	Purpose
Telephone Main Lines in Operation--Exchange Capacity Ratio (%)	Rate of the number of lines in operation in a switching facility (N) to the capacity of the facility (N); (N/N)	To be discussed with the executing agency	To assess how switching facilities are operated by looking at the proportion of equipment that is actually used
Telephone Traffic--local, toll, or international (calls × min)	<Local traffic> Traffic that is exchanged within the area covered by the inner city switching facility <Toll traffic> Traffic that is exchanged through a point outside the area covered by the inner city switching facility <International traffic> Traffic that is transmitted from a given country to a foreign country and traffic that arrives from a foreign country into the country <Telephone traffic> Telephone traffic = number of calls × average holding time	Predicted demand value	To show telephone traffic that is actually provided by duration and number of calls that users make
Call Completion Rate (%)	Ratio of the number of calls connected (N) among the number of calls tried (N); (N/N)	To be discussed with the executing agency	To show capacity of the facility and maintenance condition by the quality of line connection
Fault Ratio (%)	Number of failed calls per 100 calls in a year	To be discussed with the executing agency	To show technical stability and maintenance condition by number of occurrences of failure
Faults Cleared by Next Working Day	Percentage of faults cleared by the next working day	To be discussed with the executing agency	To illustrate maintenance condition and maintenance ability based on time from occurrence of faults to their recovery

Name	Definition	Target	Purpose
Telephone Density (%)	Number of telephones installed per 100 population	Predicted demand value	To show how much the project contributes to the popularization rate of telephones
Waiting List for Main Lines (Lines)	Number of lines that are applied for and are on the waiting list for service	To be discussed with the executing agency	To show how much the project contributes to eliminate back-log application
Telephone Traffic--local, toll, or international (calls × min)	(Same as the operation indicator)	Predicted demand value	To show how much the project contributes to the increase of traffic
Area/Population Ratio Who Can Use Telephone Services (m^2 or Persons)	<Ratio of area in the district where telephone service is available> (N/N) Ratio of area where telephone service is available when applied for (N) to the area of a given district (N) <Ratio of population in the area where telephone service is available>(M/M) Ratio of people who live in the area where telephone service is available when applied for (M) to the population of a given district (M)	To be discussed with the executing agency	To show how much the project contributes to the expansion of the area where telephone service is available and the increase of people who can have telephone services installed in a given country (area)
Number of Internet Users/Providers	(As shown by the name of the indicator)	To be discussed with the executing agency	To show how much the project contributes to the popularization of the Internet

Water Supply

Name	Definition	Target	Purpose
Population Served (Persons)	Population that receives water supply services per year To be assessed yearly	To be discussed with the executing agency	To show the basic current status of operation of water supply project
Amount of Water Supply (m^3/Day)	Maximum daily water supply = (the maximum amount among daily water supplies in a year) Average daily water supply = (annual total water supply)/ (number of days in a year) To be assessed yearly	To be discussed with the executing agency	To show the basic current status of operation of water supply project
Rate of Facility Utilization (%)	Rate of Facility Utilization (maximum) = (maximum daily water supply)/ (capacity of the facility) × 100 Rate of Facility Utilization (average) = (average daily water supply)/ (capacity of the facility) × 100		
Non-revenue(earning)Water Rate (%) Revenue (earning) Water Rate (%)	(Non-revenue water rate: water supply that is not to be charged)/ (water supply) × 100 (Revenue water rate: water supply that is to be charged)/ (water supply) × 100 To be assessed yearly	To be discussed with the executing agency	To show the basic current status of operation of water supply project
Leakage Rate (%)	(Volume of leakage)/ (water supply) × 100 To be assessed yearly	To be discussed with the executing agency	To assess the current status of maintenance and operation of water supply facilities, etc.
Amount of Water Intake (m^3/Day)	Maximum water intake = (maximum amount among daily water intakes in a year) Average water intake = (annual total water intake)/ (number of days in a year) To be assessed yearly	To be discussed with the executing agency	To assess the current status of securing water resources

Name	Definition	Target	Purpose
Water Quality	Value associated with water quality To be assessed yearly (when values are expected to fluctuate depending on seasons, seasonal assessment is necessary)	Meeting the water quality standards and maintaining the quality	To assess the current status of maintenance and operation of water purification plants

Name	Definition	Target	Purpose
Percentage of Population Served (%)	(Population served)/ (population in the project area) × 100 To be assessed yearly	To be discussed with the executing agency	To grasp general effectiveness of water supply projects
Water Supply per Capita (L/Person and Day)	Maximum daily water supply per person = (maximum daily water supply)/ (population served) Average daily water supply per person = (average daily water supply)/ (population served) To be assessed yearly	To be discussed with the executing agency	To assess improvement of living standard and effectiveness of water conservation
Land Subsidence (cm/Year)	Amount of land subsidence accompanying ground water use To be assessed yearly	To be discussed with the executing agency	To assess effectiveness of prevention against land subsidence
Revenue on Water Supply	Income of the project executer through water rate collection To be assessed yearly	To be discussed with the executing agency	To assess effectiveness of measures to improve water rate collection
Percentage of Population Served (%)	(Population served)/(population of the administrative district) × 100 To be assessed yearly	To be discussed with the executing agency	To grasp general effectiveness of water supply projects

Education

Name	Definition	Target	Purpose
Intake Rate	Intake rate = (number of new entrants in the first grade/ number of children who have reached the official age of the first grade) × 100	—	Basic indicator to show the size of population that is accepted in the education system in each school year and future prospects
Enrollment Ratio	Enrollment ratio = (number of students who have enrolled in a given level of education/ number of children of the official age-group for that level of education)	—	Basic indicator to show population enrolled in schools of the whole education system in each school year
Male-Female Ratio	Numbers by sex concerning each indicator	—	Basic indicator to show accessibility to the education service
Promotion Rate	Promotion rate = number of students in a given grade who will be promoted to a higher grade in (T+1) year/ number of students in the given grade who enrolled in (T) year	—	Basic indicator to show internal efficiency of the education system
Completion Rate	Completion rate (assuming 6-year education) = number of new entrants in (T-6) year / number of students who have completed school in (T) year	—	Basic indicator to show internal efficiency of the education system
Share of Students by Subject	Ratio of students in each major = number of students in a certain major/ total number of students	—	Basic indicator to show the importance of each subject majored at vocational schools and schools of higher education
Student Test Scores	Values should be collected from the country's statistics on education	—	Basic indicator to show academic achievement of students and quality of education
Repetition Rate	Repetition rate = number of students in a certain grade who will repeat in (T + 1) year/ number of students in the same grade in (T) year	—	Basic indicator to show internal efficiency of the education system

Name	Definition	Target	Purpose
Drop-out Rate	Drop-out rate = number of students in a given grade who drop-out in (T + 1) year/ number of students in the same grade in (T) year	—	Basic indicator to show internal and external efficiency of the education system

Name	Definition	Target	Purpose
Student - Teacher Ratio	Student - teacher ratio = number of students/ number of teachers	—	Basic indicator to assess quality of education
Qualified Teacher Ratio	Qualified teacher ratio = number of qualified teachers/ number of teachers	—	Basic indicator to assess quality of education
Teachers per Class	Teacher per Class = number of teachers/ number of classrooms	—	Basic indicator to assess quality of education
Students per Classroom	Students per Classroom = number of students/ number of classrooms	—	Basic indicator to assess quality of education
Female Teacher Ratio	Female teacher ratio = number of female teachers/ number of teachers	—	Indicator to assess quality of education and gender-equality
Name	Definition	Target	Purpose
Classroom Area per Student (m^2)	Classroom Area per student = classroom area (m^2)/ number of students	—	Basic indicator to assess quality of education
Textbook - Student Ratio	Textbook - student ratio = number of textbooks/ number of students	—	Basic indicator to assess quality of education
Distance from School (km)	—	—	Basic indicator to assess access methods to education
Name	Definition	Target	Purpose
Public Education Expenditure Share of GNP	Public education expenditure share of GNP = public education expenditure/GNP	—	Basic indicator to show the scale of expenditure in the field of public education in the economy of a given country
Public Education Expenditure Share of Total Government Expenditure	Public education expenditure share of total government expenditure = public education expenditure/total government expenditure	—	Basic indicator to show the size of expenditure in the field of public education compared to the total expenditure of a given country's government
Teacher Salary Share of Total Education Expenditure	Teacher salary share of total education expenditure = teacher salary/public education expenditure	—	Basic indicator to show the size of expenditure as teacher salary compared to that of the field of public education

Name	Definition	Target	Purpose
Education Expenditure per Student	Education expenditure per student = public education expenditure/number of students	—	Basic indicator to show the size of public education expenditure per student
Per Student Expenditure Between Primary and Tertiary Education	Per student expenditure between primary and tertiary education = per student expenditure of primary education/per student expenditure of tertiary education	—	Basic indicator to show the gap between public education expenditure per student for primary education and that for tertiary education

Name	Definition	Target	Purpose
Actual Annual Instruction Time	From data on educational statistics Ratio between Official Instruction Time and Actual Instruction Time	—	Basic indicator to assess quality of education

Note: In the education sector, output indicators and indicators that compare the predicted level of using output and actual level of using

output are adopted as operation indicators. The outcome of the project that meets the project goal and the impact are adopted as effect indicators. As indicators should correspond to the project goals, indicators adopted may vary and there may be more effective indicators depending on the project goals. When values that should be compared to, for example, base lines and control groups, are not fixed, effectiveness will be reduced.

Tourism

Name	Policy and method of establishing the indicator	Target	Purpose
Operation indicators in the other sectors: Roads, Aviation, Ports and harbors, Water supply, Sewage system, and Forestation, etc., should be adopted.			
Number of Visitors	Number of visitors that entered the target facilities Annual total and monthly total (It is desirable to show by foreign citizens and domestic citizens)	Predicted demand value	To assess if the target facilities are properly operated (utilized)
Entrance Fee	Entrance fee to the target area Annual total (It is desirable to show by foreign citizens and domestic citizens)	Predicted demand value	

Name	Policy and method of establishing the indicator	Target	Purpose
Number of Tourists	In each whole region (prefecture or state) or whole country Annual total (It is desirable to show by foreign citizens and domestic citizens)	Predicted demand value	Most of tourism projects that are requested by developing countries aim at obtaining foreign currency. Sub-projects also have a wide range of goals. In such projects, adopting these indicators as priority goals in a political perspective is considered to be appropriate.
Income from Tourism	Income from tourism in national finance Annual total	Predicted demand value	
Number of Hotel Guests	Number of hotel guests in the target area (separately or all together) Annual total and monthly total (It is desirable to show by foreign citizens and domestic citizens)	Predicted demand value	To assess the number of visitors to the project target area

Notes: As shown by the cases in the past, most requests from developing countries are: (1) projects for promote and develop tourism with a wide range of project goals, such as obtaining foreign currency, employment creation, regional development; and (2) projects for attaining the goals in the above (1) consisting of many sub-projects with a wide range of improvement targets, from museums, infrastructure including roads, airports, ports, harbors, water supply, sewage system, to environment conservation (forestation). Accordingly, these circumstances should be taken into consideration when operation and effect indicators are established.

Table VI-1 JBIC's Rating Criteria

No	Item	Points	Criteria	Notes
(1)	*Relevance*	Evaluate the relevance to development needs at appraisal and at present, and consistency with development policies.	Consistency with needs/policies ◎ Partial problem in consistency with needs/policies ○ Serious problem in consistency with needs/policies △	
(2)	*Effectiveness (impact)*	Compare planned and actual figures to measure the effectiveness.	80% or more of the original plan ◎ 50% or more, but less than 80% of the original plan ○ Less than 50% of the original plan △	Consider multiple indicators to measure the effectiveness of the project, based on the major effectiveness indicator
(3)	*Efficiency*	Compare planned and actual, in terms of project output, term, and cost. Based on the results of each comparison, rate the overall efficiency of the project	<u>1. Output</u> (output) 80% or more of the original plan ◎ 3 points 50% or more, but less than of the original plan ○ 2 points Less than 50% of the original plan △ 1 point <u>2. Project Period</u> (input) 100% or less of the original plan ◎ 1 point More than 100%, but 150% or less of the original plan ○ 2 points More than 150% of the original plan △ 3 points <u>3. Cost (Total project cost in foreign currency)</u> (input) 100% or less of the original plan ◎ 1 point More than 100%, but 150% or less of the original plan ○ 2 points More than 150% of the original plan △ 3 points <u>4. Overall Efficiency</u> Overall efficiency > 2.50 ◎ 2.50 > Overall efficiency = 1.50 ○ Overall efficiency < 1.50 △	Output is constructed facilities and/or procured equipment and materials. If there is a change in output, take into consideration that. **Overall efficiency** **= output /((term+cost)/2)**
(4)	*Sustainability*	Evaluate the sustainability based on the financial aspects, consider technical capacity and operations & management system	Highly sustainability ◎ No major problem ○ Major concern at evaluation △	Rate △ for projects with liabilities exceeding assets, chronically in the red, with severe budget shortages, etc.
(5)	*Overall Rating*	Perform an overall rating	Refer to flowchart on previous page.	

Figure VI-1 JBIC's Rating Tree