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Ex-Post Evaluation Report for Bolikhan Small Town Water Supply Project in Bolikhamxai Province, Lao P.D.R.

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This evaluation study was entrusted to Future Resources Institute-DongHae Engineering& Consultants co., Ltd. Consortium by KOICA for the purpose of independent evaluation research. The views expressed in this report do not necessarily reflect KOICA's position.

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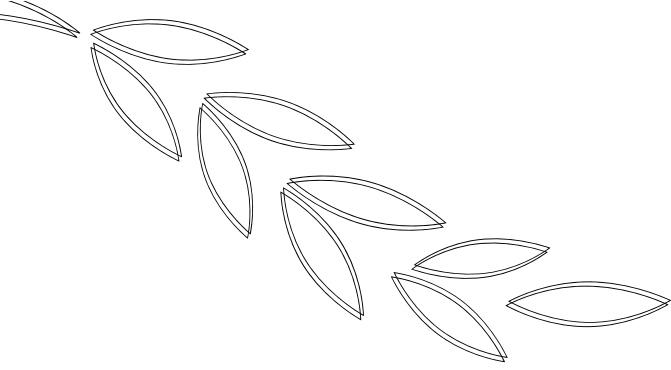
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List of Abbreviations

Abbreviation	Official name
ADB	Asian Development Bank
DAC	Development Assistance Committee
E. coli	Escherichia coli
EIA	Environment Impact Assessment
ESCAP	Economic and Social Commission for Asia and Pacific
EU	European Union
FAO	Food and Agriculture Organization
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
K-Water	Korea Water Resources Corporation
MCTPC	Ministry of Communication, Transport, Post and Construction
MDG	Millennium Development Goals
MPWT	Ministry of Public Works and Transport
NGO	Non-Governmental Organization
NGPES	National Growth and Poverty Eradication Strategy
NSEDP	National Socio-Economic Development Plan
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PM	Project Manager
PMC	Project Management Consultant
R/D	Record of Discussions
SIP	Sector Investment Plan
SWOT	Strength, Weakness, Opportunity, Threat
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development
VE	Value Engineering



Executive Summary



Executive Summary

○ Bolikhan Small Town Water Supply and Sanitation in Bolikhamxai Province Ex-Post Evaluation

The Korea International Cooperation Agency (KOICA) ran the Bolikhan Small Town Water Supply and Sanitation in Bolikhamxai Province project between 2007 and 2010. The ex-post evaluation assesses the project outcome on relevance, effectiveness, efficiency, impact, sustainability, and cross-cutting issues according to OECD/DAC evaluation criteria. The evaluation measures the project's outcomes and will allow KOICA to improve the effectiveness of similar projects in the future. Additionally, the ex-post evaluation can contribute to the enhancement of the KOICA ODA project evaluation.

○ Development of integrated logical framework for ex-post evaluation

Previous ex-post evaluations focused extensively on qualitative assessment and relatively overlooked technical aspects. This ex-post evaluation tries to overcome these limitations by developing an integrated logical framework using Value Engineering (VE). Future Resources Institute and Donghae Engineering and Consultants formed a consortium that combines policy and technology to enhance ex-post evaluation suitability and reliability during process, performance, and summative evaluations.

○ The Project produced positive outcomes, but requires improvements

The Bolikhan project produced positive evaluation results, especially in relevance, effectiveness, efficiency, and impact. This project improved the livelihood of the local residents by providing a safe and clean water supply system, but little

preliminary research was conducted to address recipients' needs. Consequently, there were limitations on the project's planning, establishment, and implementation as well as overlooking the cross-cutting issues: gender mainstreaming and environment. In addition, there is little support from the recipient nation after the project's completion and KOICA's weak exit strategy hinders the project's impact. The detailed results of the ex-post evaluation can be found on the tables below.

○ Suggestions for improving the project

Based on the results of the evaluation, specific suggestions to increase the effectiveness, impact, and sustainability of software and hardware are introduced. Hopefully, KOICA's headquarters, KOICA's regional office, and the recipient government may discuss the feasibility of implementing the suggestions. The most urgent improvements for the facility are: ① to provide funds for water supply lead-in construction for low-income families, ② to have a standard maintenance model for a sanitary environment around the water supply system and to increase drinking water facility operational rate, ③ to improve road conditions in and around the drinking water facility, ④ to decrease or eliminate odor from chlorine treatment, and ⑤ to improve bottled water delivery service.

Relevance	Results
Agreement between project goal and KOICA's policy	Project goal and KOICA's policy agree in providing a clean water supply
Agreement between project and recipient's policies	Agree with the Laos National Development Plan
Relevance of project plan	Project planning appropriate, but some recipients' needs not met
Relevance of project purpose, duration, and budget	Purpose and duration appropriate and project within the budget
Relevance of experts' activities and support equipment	Experts' activities and support equipment effectively utilized
Relevance of trainee selection	Unsatisfactory selection of trainees
Relevance of drinking water facility construction and goals	Drinking water facility met project goals

Effectiveness	Results
Overall achievement	Met goal of providing safe drinking water and water for household use
Achieving goals during project planning	Met goals of facility construction and quantity of water supplied
Effectiveness of training program	Unsatisfactory effectiveness of training program

Efficiency	Results
Efficiency of management, construction cost, and labor input	High design and construction effectiveness
Communication among stakeholders	Effective communication among stakeholders
Efficiency of project execution	Lowered efficiency due to language barrier
Efficiency of support for water facility/cost effectiveness	Cost effective construction

Impact	Results
Social/Cultural/Environmental impact after project completion	Decreased incidences of waterborne disease and other positive impacts as a result of improved living conditions
Impact of drinking water facility on recipient country or local region	Increased regional population, but no real impact on policy or capacity building

Sustainability	Results
Criteria and methods for sustaining facility maintenance	KOICA's weak exit strategy and limited support from the Laos government after project
Local personnel capacity building for continued maintenance of water facility	Personnel training and capacity building not systematically provided
Utilize local natural resources to sustain drinking water facility	Materials relatively easy to acquire in local region

Gender Mainstreaming	Results
Reflection on gender mainstreaming during project implementation	Not reflected
Impact on gender mainstreaming during project implementation	No impact

Environment	Results
Reflection on environment during project implementation	Not reflected
Impact on environment by the Bolikhan safe and clean water project	No impact



Overview



I

Overview

This chapter introduces and summarizes the background, objectives, scope, and characteristics of the Bolikhan Small Town Water Supply and Sanitation in Bolikhamxai Province ex-post evaluation. This will provide a background to understand Chapter II (Evaluation Criteria and Methodology), Chapter IV (Comprehensive Evaluation Results), and Chapter V (Suggestions for Improvement).



1. Background and Objectives

1.1 Background

1) Drinking water supply issues in developing countries

One of the Millennium Development Goals (MDGs) is to provide safe and clean drinking water. The international community recognizes that water is highly associated with poverty, agriculture, energy, health, biodiversity, and environmental conservation. Therefore, many different ways to address the water crisis are being developed by cooperation (Park, 2009). However, approximately 1/5 of the world's population, or 1.2 billion people, have difficulty in accessing clean water. Most of these people live in developing countries in Asia and Africa.

2) KOICA drinking water supply aid

To address the water crisis, KOICA has increased its drinking water supply development grant aid for developing nations. This is closely associated with KOICA's health care support strategy (2011-2015) and regional development program (rural areas and poverty reduction).

3) Laos project outcomes and lessons learned

The project and identified obstacles are to establish a strategy for sustaining management and operation on the current project as well as improve future ones. This is intended to increase KOICA's aid effectiveness by drawing from the lessons learned through analysis.

1.2. Objectives

1) Project performance evaluation

The objective of the evaluation is to analyze the improvements in quality of life and access to safe and clean water for the local recipients.

2) Advancement of Korean ODA evaluation

The successes and failures of the project are assessed according to the systematic evaluation process of the Paris Declaration on Aid Effectiveness and OECD/DAC. This can strengthen ODA project evaluations in quantitative and qualitative aspects.

3) Asian ODA evaluation model proposal

This ex-post evaluation proposes a relevant Asian ODA evaluation model that

KOICA can utilize based on the newly developed assessment process. This may be utilized as an exemplary case for most of the subsequent safe and clean water supply project evaluations by combining policy and technical assessments.



■ 2. Evaluation Scope

This evaluation is intended to assess the effectiveness and impact of the project 2 years after the completion of the project. It looks at the short-term goal of providing safe clean water and the long-term goal of increasing quality of life. The scope of the evaluation is divided into spatial, temporal, and functional parts.

2.1. Spatial Scope

The project benefits 7 villages: Phonsy, Symoungkhoun, Watthad, Nahaene, Sisavath, Done, and Xiengtom located in Bolikhan of Bolikhamxai Province.

2.2. Temporal Scope

The evaluation of the project spans from 2006, when the Laos government submitted the formal request for the project, to 2012 with this evaluation.

2.3. Functional Scope

Functional scope involves both process evaluation (project planning and strategy, dispatch of experts, etc.) and performance evaluation (water supply system construction, drinking water plant construction, equipment support, inviting trainees to donor country for training, etc.).



3. Evaluation Characteristics

3.1. Integration of Policy and Technology Evaluation

The previous ex-post evaluations have focused heavily on policy or qualitative assessments and overlooked the technological aspects. This limitation is overcome in the new evaluation by the integrated logical framework that utilizes Value Engineering.

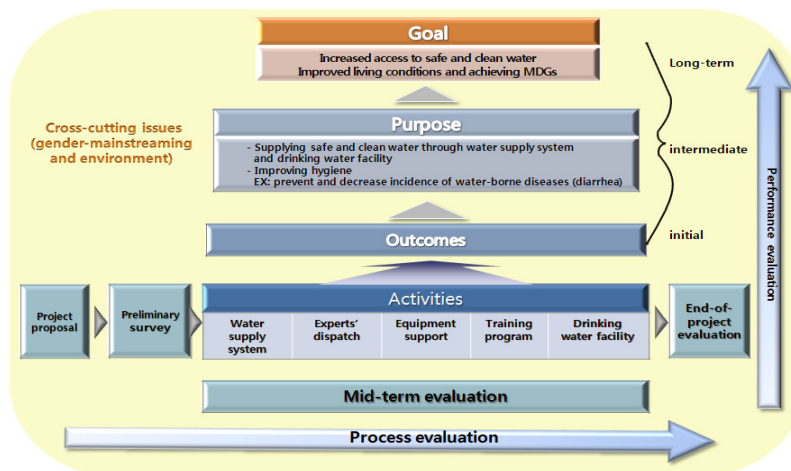
3.2. Suggestions for Improving the Effectiveness of the Current Project

Based on the evaluation results in Chapter IV, specific suggestions are proposed in Chapter V to improve effectiveness of the project. Therefore, KOICA headquarters, KOICA's regional offices, and the recipient country may discuss the feasibility of implementing the suggestions for improved operation and management.

3.3. Multi-Dimensional and Multi-Faceted Evaluation

The integrated logical framework was developed to acquire systematic and objective assessment results (Figure 1-1).

<Figure 1-1> Integrated Logical Framework as Evaluation Mode



3.4. Using and Improving KOICA's Evaluation Guidelines

This process utilizes various KOICA guidelines in order to analyze and supplement previous ex-post evaluation reports.

3.5. Strengthening the Partnerships with Recipient Countries

This ex-post evaluation collects the perspectives of Lao government officials and local design and construction companies through active participation and acquired preliminary data for capacity building. Lao government officials accompanied the evaluators on the field survey and preliminary evaluation results were shared with them through two meetings. This strengthens cooperation and communication between the two countries and serves to increase the positive image of Korea and KOICA.

3.6. Participatory Evaluation

In order to gather opinions on the project, general interviews, in-depth interviews, discussions, and an advisory council are utilized. In addition, direct beneficiaries of the project are given questionnaires, household visits, and in-depth interviews to assess how their quality of life is affected. These questions were conducted by a local coordinator, a university professor bilingual in English and Lao, to obtain objective responses from the residents.



Evaluation Criteria and Methodology



II

Evaluation Criteria and Methodology

This chapter explains the criteria and methodology used to increase reliability for the evaluation. Additionally, this provides transparency and objectivity toward the process and shows the criteria with which the evaluation is carried out.



1. Evaluation Schedule

- Evaluation Period (6 months) June 25, 2012 (Friday) - November 24, 2012 (Saturday)

- Specific Schedule: 3 phases with evaluation planning, execution, and modification and finalizations <Table 2-1>.
 - Evaluation Planning: document review, interview planning, field survey planning and preparation, interview and questionnaire development, and briefing session (initial, intermediate, final)
 - Evaluation Execution: interviews in Korea and Laos, questionnaire in Laos, on-site visit and data collection, and VE evaluation
 - Modification and Finalization: survey analysis, advisory council meetings, report draft, and submission of report

<Table 2-1> Evaluation Schedule by Activity

Activity		Jun		Jul		Aug		Sep		Oct		Nov	
		Early	Late	Early	Late	Early	Late	Early	Late	Early	Late	Early	Late
Evaluation Planning	A. Survey Planning												
	B. Korean Documentary Review and Analysis												
	C. Briefing Session (Initial, Intermediate, Final)												
	D. Interview and Questionnaire Development												
	E. Korea/Laos Interview Planning												
	F. Field Survey Planning and Preparation												
Evaluation Execution	A. Interviews in Korea												
	B. First and Second Field Survey												
	C. On-Site Visit and Data Collection												
	D. Interviews in Laos												
	E. Questionnaire in Laos												
	F. VE Evaluation (Brainstorming and Assessment)												
Modification and Finalization	A. Survey Analysis												
	B. Advisory Council Meeting												
	C. Report Draft												
	D. Report Revision												
	E. Submission of Final Report (Korean)												
	F. Submission of Final Report (English)												
Cumulative Progress (%)		20%		45%		65%		85%		95%		100%	



2. Evaluation Criteria and Methodology

2.1. Evaluation Criteria and Items

The evaluation measures the outcomes of the project based on the three levels; initial, intermediate and long-term according to the logical frame. This process allows for assessing each activity and output of the project. <Table 2-2> below is modified with document reviews.

<Table 2-2> Performance Level Assessments

Levels	Contents	Verification	Verification methods	Evaluation basis	
Long-term outcomes	Goal <ul style="list-style-type: none"> ○ Beneficiaries' quality of life ○ Access to safe and clean water ○ Living conditions and MDGs 	<ul style="list-style-type: none"> - Impact on beneficiaries' livelihood (quality of life/satisfaction) - Long-term recipient nation's goals (agreement with national policy) 	Questionnaire Document review Interview	Relevance Impact Sustainability	Gender mainstreaming Environment
Intermediate outcomes	Purpose <ul style="list-style-type: none"> ○ Waterborne diseases ○ Safe and clean water for drinking and household use 	<ul style="list-style-type: none"> - Incidence of waterborne diseases (diarrhea by E. coli) - Access to safe and clean water (water for drinking and household use with appropriate quality) 	Questionnaire Document review Interview Field survey VE analysis		
Initial outcomes	Outcome <ul style="list-style-type: none"> ○ Water supply system and drinking water plant ○ Training experts 	<ul style="list-style-type: none"> - Current status of water for drinking and household use - Training experts by training program and PMC 	Document review Field survey VE analysis	Relevance Effectiveness Efficiency	

2.2. Evaluation Methodology

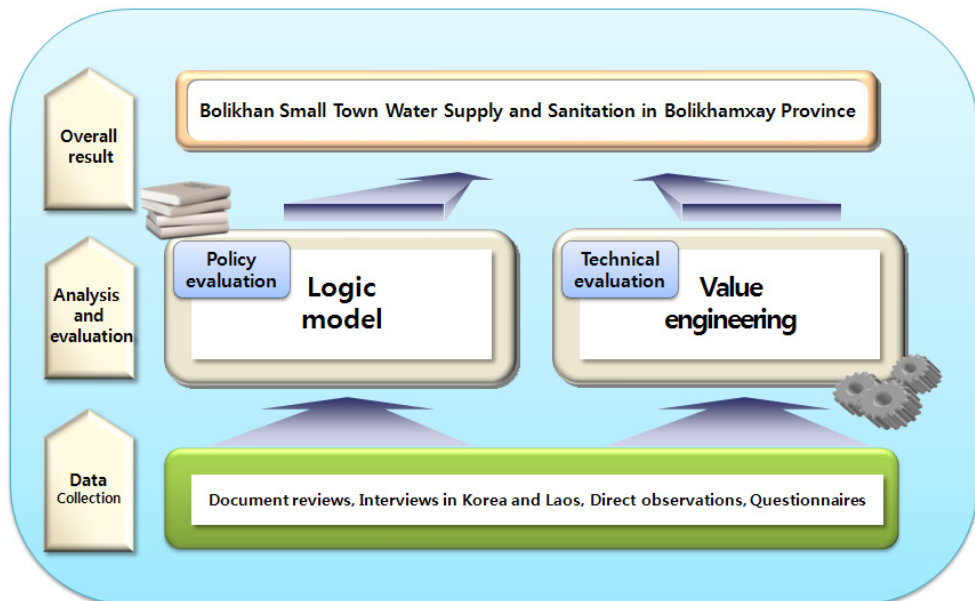
The evaluation utilizes document reviews, interviews with stakeholder, questionnaire with beneficiaries, field survey, and VE analysis. Additionally, individual in-depth interviews, meetings, discussions, and advisory councils allow stakeholders to exchange opinions as well as project data.

2.2.1 Qualitative Assessment

1) Document Review

The collected data includes documents from KOICA, the dispatched experts, field surveys, online resources, the local coordinator, and responses to the questionnaire.

<Figure 2-1> Laos Safe and Clean Water Development Project Evaluation Methods



2) Stakeholders Interviews

The purpose of the interview is to collect the opinions or suggestions from stakeholders and to apply the resulting ideas for similar projects in the future. Semi-structured interviews are carried out with various stakeholders in Korea and Laos.

(1) Korean Stakeholders Interviews

The interviews with Korean stakeholders are to compile their opinions and suggestions on the project and evaluation. The point of the interview is to find out if the stakeholders think the project goals are achieved, if there were any issues from project planning to implementation, and if there are suggestions for improvement <Table 2-3>.

<Table 2-3> List of Korean Stakeholder Interviewees and Interview Contents

Interviewee	Interview Contents
○ PMC(K-water), Dispatched 3 experts (K-water employees)	- Technical effectiveness, project efficiency, handling challenges
○ Mid-Term Evaluation Team : Previous chief representative of KOICA in Laos	- Progress, effectiveness, efficiency, etc.
○ End-of-Project Evaluation Team : Staff members of KOICA Headquarters and KOICA Laos Office	- Achievement of goals, meeting goals, project efficiency, sustainability, etc.

(2) Lao Stakeholder Interviews

The interviews with Lao stakeholders are conducted to get the perspective of the Lao people in respect to the project goals and operation. The questions focus on the project's relevance, effectiveness, and impact; the answers are then organized and examined in the evaluation <Table 2-4>.

<Table 2-4> List of Lao Stakeholder Interviewees and Interview Contents

Interviewee	Interview Content
○ Project beneficiaries : Local residents of Bolikhan, Laos	<ul style="list-style-type: none"> - Satisfaction with the project and issues regarding the project - Recognition of cross-cutting issues(gender mainstreaming and environment)
○ Central government officials (MPWT)	<ul style="list-style-type: none"> - Information about R/D consultation and contract signing - Feasibility and relevance of project - Effectiveness of project - Support and cooperation agreement
○ Local government stakeholders of Bolikhamxai	<ul style="list-style-type: none"> - Project performance, effectiveness, impact, and sustainability
○ KOICA Laos Bureau	<ul style="list-style-type: none"> - Project effectiveness, efficiency, impact, and sustainability
○ Lao stakeholders	<ul style="list-style-type: none"> - Efficiency and effectiveness of project budget - Completion of project outputs - Relationship with KOICA and K-water - Efficiency of PMC and project sustainability

(3) Field Survey

<Table 2-5> Outline of First Field Survey

Action	Findings
Interview with central and local government officials	<ul style="list-style-type: none"> - Need for safe and clean water - Lack of specific policies and information
Interview with beneficiaries and trainees	<ul style="list-style-type: none"> - Ineffective training program - Preference for bottled drinking water
Facility visits and inspection	<ul style="list-style-type: none"> - Satisfactory construction of water supply facility - Need to repair the chlorine treatment facility - Need to improve low operational rates - Need to support low-income residents to install water supply - Need to increase capacity building of facility personnel - Lack of sanitary conditions around water supply system
Visit to Asian Development Bank (ADB)	<ul style="list-style-type: none"> - Verify drinking water project road map based on ADB criteria
Visit to similar French-funded facilities	<ul style="list-style-type: none"> - Low quality construction of facilities by local companies due to lack of PMC



Photo 2-1 Discussions with central and local government officials



Photo 2-2 Discussions with design and construction companies



Photo 2-3 Interviews with beneficiaries and trainees



Photo 2-4 Project on-site inspection



Photo 2-5 KOICA drinking water system (PMC: K-Water)



Photo 2-6 On-site visit to French-funded facility (construction by local company)

<Table 2-6> Outline of Second Field Survey

Action	Findings
Discussions with central and local government officials to share preliminary evaluation results	<ul style="list-style-type: none"> - Share preliminary evaluation results and discussions - Lack of specific policies and information regarding aid for low-income households - Lack of long-term development plans for water supply system
Interviews with beneficiaries and visits to local households	<ul style="list-style-type: none"> - High level of satisfaction with the project - Receive suggestions to improve drinking water facility - Unsanitary living conditions of beneficiaries
On-site visit to facility and tour of water quality lab	<ul style="list-style-type: none"> - Satisfactory operation and management - Disregard for issues raised from first field survey - Need for enhanced sense of responsibility and capacity building - Insufficient lab equipment
Visit to JICA and Chinaimo water quality analysis lab	<ul style="list-style-type: none"> - Status of lab operation and management - Simple lab equipment and number of lab workers to the minimum
Meetings with local questionnaire team	<ul style="list-style-type: none"> - Discussions on questionnaire methods or results - Remarks on beneficiaries' comments - Willingness to share information



Photo 2-7 Meetings with central and local government officials to share preliminary evaluation results



Photo 2-8 Chinaimo water quality lab in Vientiane



Photo 2-9 Water quality lab in Nampapa, Bolikhamxai Province



Photo 2-10 Drinking water facility in Bolikhan



Photo 2-11 Local water resources-Namxan river, dug well, and water supply system

(4) Internal Meetings

The internal meetings are held to increase communication, share information, and assess data effectively.

<Table 2-7> List of Internal Meetings and Contents

Joint/Advisory Council Meeting Schedule	Meeting Highlights
First Joint Meeting	<ul style="list-style-type: none"> - Evaluation schedule, progress check, and comments - Preparation for on-site survey - Develop interview questions for central and local government officials as well as stakeholders
Advisory Council Meeting	<ul style="list-style-type: none"> - Workshop for evaluation team's VE education - Ex-post evaluation progress check - Consultation with experts about interview questions - Ask experts for their thoughts on the direction of evaluations - Consultation with experts on points that should be considered in the first on-site survey
Second Joint Meeting	<ul style="list-style-type: none"> - Review the first on-site survey result (policy data) - Review the first on-site survey results (technical data) - Collect opinions on additional surveys and analysis - Discuss future plans and evaluation progress checks
First Meeting with Volunteers	<ul style="list-style-type: none"> - Identify the current on-site situation in Laos - Identify the operating status of water supply system and drinking water facility - Points that should be considered for the second on-site survey - Ask for recommendations for the second on-site visit
Second Meeting with Volunteers	<ul style="list-style-type: none"> - Consultation on the second on-site survey results - Collect opinions on points that should be considered during report preparation

2.2.2 Quantitative Assessment

1) Questionnaire

The questionnaire survey was conducted over five days from August 18, 2012 to August 22, 2012 to local residents who benefited from the project. The main purpose of the survey is to measure satisfaction levels and examine changes in perception of health care and sanitation. Furthermore, the evaluation tries to see if cross-cutting issues were reflected throughout project planning and implementation <Table 2-8>.

<Table 2-8> Questionnaire Contents

Category	Specifications	Measurement
1. General Information	1-1. Village name	Text
	1-2. Respondent's age	Value
	1-3. Respondent's gender	Text
	1-4. Respondent's occupation	Text
	1-5. Family size (male adult, female adult, male child, female child)	Value
	1-6. Annual income	Value
	1-7. Daily household water consumption	Value
2. Effectiveness	2-1. Satisfaction levels of the KOICA project	Range
	2-2. Drinking water source before and after the project	Text
	2-2-1. Explanation for drinking bottled water	Text
	2-2-2. Change in water quality and quantity after the project	Text
	2-3. Considerations when choosing drinking water	Text
	2-4. Water source for household use (excluding drinking water) before and after the project	Text
3. Impact	2-5. Estimated time for collecting water before the project	Value
	3-1-1. Health: Change in incidence of waterborne diseases (diarrhea)	Range
	3-1-2. Change in quality of life	Range
	3-1-3. Change in estimated time for females collecting water	Range

<Table 2-8> continued

Category	Specifications	Measurement
3. Impact	3-1-4. Use of free time due to decrease in time to collect water	Text
	3-2. Change in external environment outside of family due to project	Text
	3-3. Change in school absence rate for children who collect water before and after project	Range
4. Sustainability	4-1. Cases of water shortage after project	Value
	4-1-1. Price of KOICA water (20L)	Range
	4-2. Preference comparison between KOICA water and others	Text
	4-3. Delivery speed comparison between KOICA water and others	Text
	4-4. Cost to use water supply system per household per month	Value
	4-5. Frequency of water supply system use	Text
	4-6. Opinions on use of water supply system	Text
5. Gender Mainstreaming	4-7. Agency responsible for repairing water supply system	Text
	5-1. Individual responsible for collecting water in household	Text
	5-2. Income-generating activities by household female(s)	Text
	5-3. Main activities performed by household female(s)	Text
6. Environment	5-4. Female participation in KOICA project	Text
	6-1. Local residents' perceptions on whether the project considered the environment	Text
7. Comment	6-2. Environmental impact due to the KOICA project	Text
	7-1. Additional comments	Text

The area where beneficiaries reside has a high illiteracy rate and low education levels. Therefore, the questionnaire was adapted as accordingly:

(Evaluation team) Compose questionnaire in English

→ (Coordinator) Translate questionnaire from English to Lao

→ (Survey team) One-on-one survey by reading the questions to residents

→ (Coordinator) Translate Lao responses to English

→ (Coordinator) Send questionnaire responses and results to evaluation team

→ (Evaluation team) Verify the data and analyze the results
(Excel frequency analysis)

2) Value Engineering (VE)

VE is introduced to strengthen technical assessment and supplement qualitative assessment. It is used to analyze relevance, effectiveness, efficiency, and sustainability in addition to evaluate a project's progress, operation, and feasibility of incorporating suggestions.



Photo 2-12 Questionnaire in Lao and interview with beneficiaries



3. Evaluation Constraints and Limitation

3.1. Constraints on Evaluation

- (Adjusting the project to the initial goal) The initial aim of the project was to supply safe and clean water for consumption and household use. However, there was a discrepancy between the original goal and the project activities and thus it led to the introduction of an additional drinking water facility in 2010 after the completion of water supply system.

- (Project procedure analysis constraint) Few people have complete knowledge of the project from planning to completion and maintenance due to changes in management.
- (Lack of basic data) It is difficult to quantitatively assess the project's impact because the recipient nation lacks the basic data necessary to effectively evaluate the project.
- (Communication constraint) There were language barriers because the local residents who speak Lao, had difficulties with the evaluation which was conducted in English. Although there were translations for the evaluation, issues were still raised in effective communication.

3.2 Limitation of Evaluation Methodology

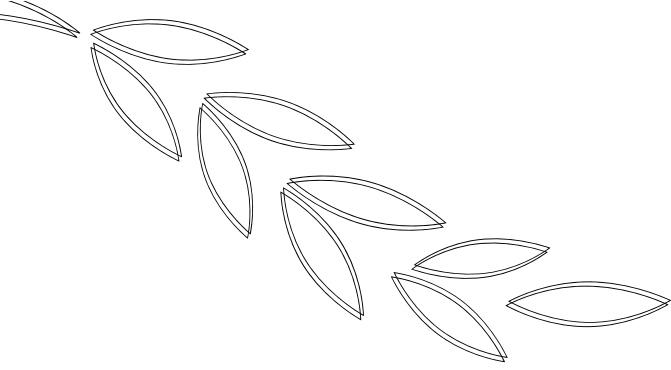
- (VE application and analysis limitations) Korean experts had some difficulty proposing appropriate suggestions for certain situations because of the different types of design and construction technology in Laos.
- (Questionnaire limitations) Some local residents had difficulty comprehending questions due to incorrect translations.
- (Representativeness of evaluation results limitations) There were time constraints on interviews with officials, facility staff, and beneficiaries as well as on the visits to the project site and residents' homes. Thus, the evaluation may not be representative of the actual consequences of the project.

3.3 Significance of Evaluation

- Despite the constraints and limitations, the evaluation offers a practical

assessment of the outcomes and provides a reference for similar projects in the future. The following steps are taken to minimize the possibility of errors.

- The evaluation recognizes that the water supply system and drinking water facility complement each other in order to meet the goal of supplying safe and clean water for both consumption and household use.
- Even though there is a lack of basic data and documents, general interviews, in-depth interviews, and information collected in field surveys were conducted to complement the lack of information.
- Translation work was managed by the local coordinator and perused by the local KOICA staff to minimize errors.



Evaluation Outline



III

Evaluation Outline



1. Project Background and Purpose

1.1. Background

- According to the Sector Investment Plan (SIP, 1998-2020), the Lao government aims to have 80% of its citizens to have access to safe and clean water by 2020. Consequently, international organizations like ADB, EU, JICA, and NGOs are trying to work with the Lao government to improve sanitary environment. However, the shortage of water supply systems and the existence of poor sanitary conditions cause infant mortality, waterborne diseases, and other serious health concerns to the residents. Additionally, the majority of the people who collect water are women and children. Since the Korean government has experience in this matter, the Lao government can receive help to successfully construct water supply facilities.

- The Lao government recognized the seriousness of poor living conditions in Bolikhan, Bolikhamxai Province and set on a project development procedure to establish drinking water facilities through the Government's National Growth and Poverty Eradication Strategy (NGPES). The project's goal was to provide safe and clean drinking water to 14,000 local residents.

- The Lao government requested the South Korean government to conduct a feasibility study in 7 districts and 10 provinces to determine if they should

develop the drinking water project. However, the Korean government felt that there were already many feasibility surveys by other international organizations. Therefore, the governments of South Korea and Laos decided to build a drinking water facility in Bolikhan, Bolikhamxai Province instead of conducting a feasibility study.

1.2. Purpose

- The purpose of the project was to increase access to clean and safe water for the local residents. Furthermore, it aimed to supply clean and safe drinking water, improve hygiene in the surrounding environment, and prevent waterborne diseases. The access to a clean and safe water supply is anticipated to improve quality of life and meet the objectives of MDGs.

- ① Drinking Water Facility Construction:

Improve the drinking water supply 7 towns of Bolikhan, Laos

- ② Expert Dispatch:

Improve project implementation effectiveness

- ③ Equipment Support:

Provide equipment for office automation and improve project development

- ④ Training Program in Korea:

Provide training for Lao facility workers

- ⑤ Drinking Water Facility Construction:

Improve self-reliance and enhance positive image of South Korea

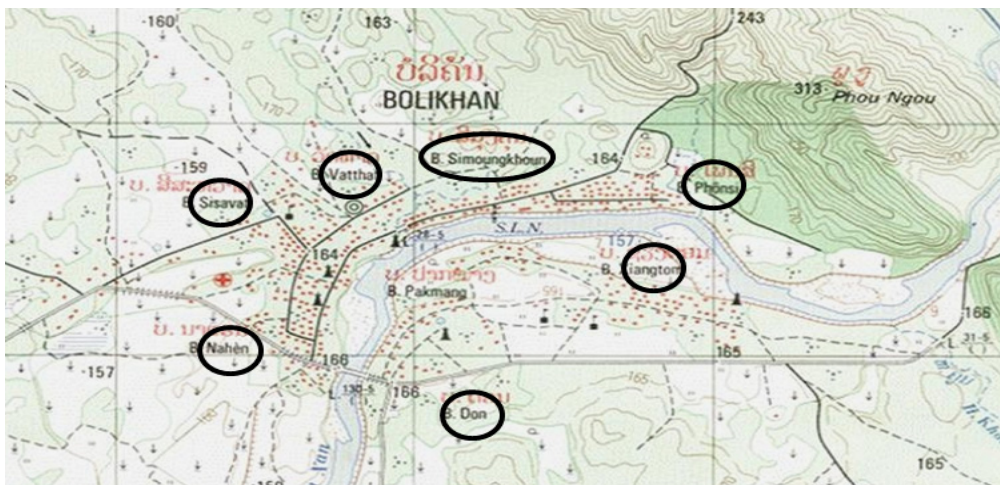


2. Project Outline

2.1. Status of project location before construction

- The project's aim was to supply safe and clean water to 7 villages: Phonsy, Symoungkhoun, Watthad, Nahaene, Sisavath, Done, and Xientom in Bolikhan, which is located to the east of the Lao capital <Figure 3-1>.

<Figure 3-1> Project Site with 7 Villages in Bolikhan



- The project site was in serious need of a sewage treatment system due to the lack of sanitation facilities in addition to the absence of a systematized drinking water supply system. Even though there was plenty of surface water from the Namxan River, most local residents used well water for consumption and household use.
- The main project period was from 2007 to 2009 for two years with a total budget of 2 million US dollars. The drinking water facility (the additional project) was conducted in 2010 with a total budget of 0.1 million US dollars. Specific details regarding the construction of the drinking water facility can be found in <Table 3-1>.

<Table 3-1> Outline of Safe and Clean Water Supply Project of 7 towns in Laos

Category	Specifications
1. Project Title	Safe and clean water supply project in 7 provinces of Bolikhan, Laos (Bolikhan Small Town Water Supply and Sanitation in Bolikhamxai Province)
2. Duration /Budget	Drinking water supply project: 2007~2009, Drinking water facility construction: Additional aid in 2010 (Budget by year: \$74 million in '07, \$93 million in '08, \$33 million in '09, \$10 million in '10)
3. Country and Region	A. Country: Laos (Lao P.D.R.) B. Region: 7 towns in Bolikhan, Bolikhamxai (Phonsy, Symoungkhoun, Watthad, Nahaene, Sisavath, Done, Xiengtom)
4. Purpose	To improve the sanitary environment and meet MDGs by supplying safe and clean drinking water to local residents of Bolikhan, Laos.
5. Major Beneficiaries	Residents of the 7 towns in Bolikhan Province
6. Implementing Agency	A. South Korea: Korea International Cooperation Agency (KOICA) B. Laos: Ministry of Communication, Transport, Post and Construction, MCTPC, Current Ministry of Public Works and Transport, MPWT.
7. Expected Results	A. South Korea - Improve the image of South Korea as an advanced donor country - Strengthen cooperation between the two nations B. Laos - Supply safe drinking water and raise awareness of sanitation - Improve quality of life by minimizing time spent on collecting water and promoting health - Promote economic development by acquiring design, construction, management, and maintenance skills
8. Major activities	A. Facility installation - Water intake facility, filtration plan, aqueduct equipment, and additional facilities B. Experts' dispatch - PM (civil engineering), survey/design supervision, civil engineering/construction supervision, mechanical/electrical supervision C. Equipment support - 2 SUVs, 4 Computers, 2 Printers, etc. D. Training Program - Training in South Korea (6 trainees for 2 weeks) E. Drinking water facility construction - Drinking water facility construction (one-story building 120㎡), equipment support



<Photo 3-1> Namxan River is the main source of water in Bolikhan

2.2. Drinking Water Facility Project Outline

- Facility capacity: 1,900m³/day
- Water-intake plant: Pontoon type, 3 Intake pumps
- Conduct pipe: GPS Pipe, D150mm, L258m
- Water purification facility: Water supply capacity 1,900ton/day
Standard water treatment process (Compound, Condensation, Precipitation, Filtration, Disinfection)
- Water pipe: DCI Pipe, D150mm, L97m
- Water reservoir: Elevated Water Storage Tank H=15m, 250ton
- Drain pipe: 23 km (D200mm~50mm)



3. Project Implementation Schedule

In May 2007, the Lao government submitted a formal request for the project to the Lao Office of KOICA. K-water, a project management consulting(PMC) organization, undertook the development for the water supply system on be half of KOICA, from December 3, 2007 to December 24, 2009. The construction of drinking water facility was started in July 2010 and was completed by December 8 of the same year. Specific information on the project schedule for the water supply system and drinking water facility are outlined in <Table 3-2>.

<Table 3-2> “Safe and Clean Water Supply Project of 7 Villages in Laos” Schedule

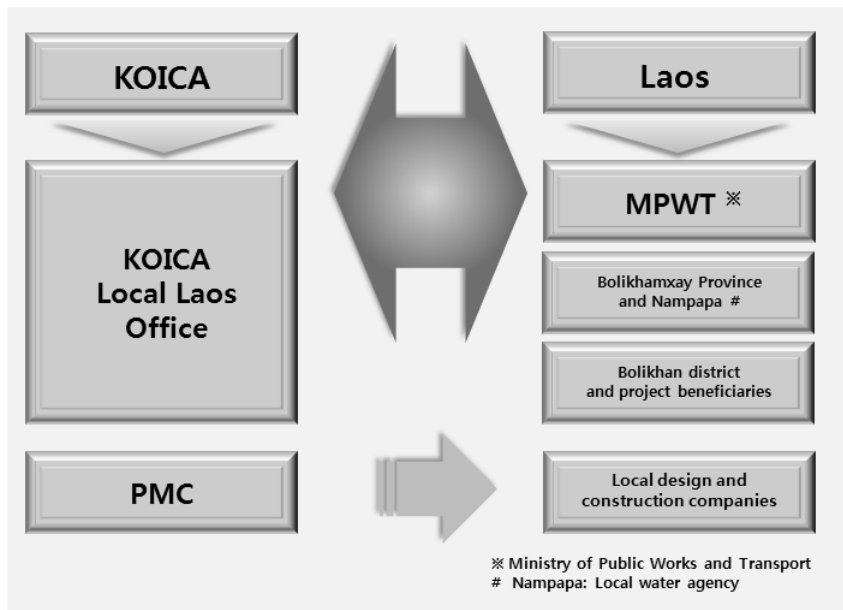
Date	Schedule
2006	6 The Korean Embassy in Laos sends the medium-term support plan (6/23)
	5 Dispatch of preliminary report group (5/20-5/27) KOICA Laos office receives formal project request (5/30)
	7 Approval of project changes (7/23)
	8 Dispatch of consultation group (7.31~8.4) and conclusion of R/D (8/2)
2007	10 Agreement between the two governments (10/5)
	11 Equipment support (2 SUVs) Shipment (11/22) Signing of contract with PMC (K-water) (12/3/2007-10/2/2009, 22months)
	12 Equipment support (9 types of computers and other supplies) Shipment (12/27) First dispatch of experts (12/13/2007-02/04/2008)
	1 Signing of design contract (1/22, LCG Ltd., \$46,000)
	2 Second dispatch of experts (2/16-10/2/2009, PM)
	5 Third dispatch of experts (5/19-7/3, construction supervisor)
	8 Training program in South Korea (6 people, 8/25-9/7)
2008	Signing of contract modifications with PMC (Korea Water Resources Corporation)
	9 Signing of construction contract (Phoutpaseuth Construction Co. Ltd.) (Contract date: 9/28, Contract fee: \$1,065,750, Contract period: 14 months from start date) Down Payment on construction by headquarters (30% of contract fee and remittance charge 0.2%, \$320,364.45)
	1 First construction payment by headquarters (15.4% of contract fee, 0.2% remittance charge, \$164,089.42)
	4 Second construction payment by headquarters (14.8% of contract fee, 0.2% remittance charge, \$158,104.61)
2009	9 Intermediate evaluation (7.13~22, 10 day written evaluation)
	7 Change in duration of PMC contract (12/3/07-10/2/09 → 12/3/07-12/2/09, 2 month extension)
	11 Construction Completion (11/2009)
	12 End of PMC contract (12/24)
	4 Approval of additional aid for drinking water facility (\$10 million)(4/5)
2010	7~11 Drinking water facility construction
	12 Facility completion ceremony(12/8)
2011	7~8 Final evaluation (7/25-8/31, approximately 6 weeks) - On-site visit and evaluation by local office (7/25-8/29) - Final evaluation report by headquarters (8/29-9/2)



4. Major Stakeholders

A characteristic of ODA projects is that there is a wide range of stakeholders from the public and private sectors of both countries. This project also includes various stakeholders with different sectorial backgrounds, from both Korea (donor nation) and Laos (recipient nation). The project evaluation divides the stakeholders into domestic and foreign groups to conduct a more systematic analysis and assessment <Figure 3-2>.

<Figure 3-2> Korean and Lao Stakeholders of the Project



4.1. Analysis of Korean Stakeholders

The Korean stakeholders are KOICA, PMC (K-water), experts who conducted the preliminary feasibility study, and other groups as specified in <Figure 3-2> and detailed in <Table 3-3>.

<Table 3-3> Evaluation Factors for Korean Stakeholders

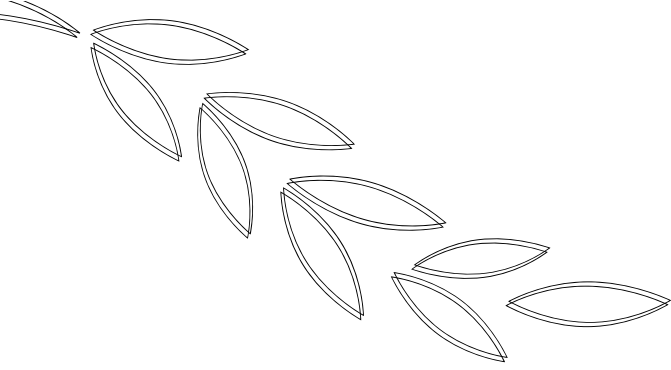
Stakeholders	Activities	Evaluation criteria	Evaluation basis
Project implementing agency KOICA headquarters	<ul style="list-style-type: none"> - Contract signing with PMC and project management - Discussions and consultations with Lao government - Experts' dispatch for preliminary survey - Conducting intermediate and end-of-project evaluations 	<ul style="list-style-type: none"> - Relevance, effectiveness, sustainability - (EX) Agreement with KOICA policy, participation with and cooperation from Laos, follow-up management and establishing systemic cooperation with Laos 	Document Review Interview
K-Water	<ul style="list-style-type: none"> - Project management experts' dispatch - Project management for design and construction - Inviting trainees to Korea 	<ul style="list-style-type: none"> - Considering relevance, effectiveness, cross-cutting issues (gender mainstreaming and environment) - (EX) Appropriateness of project design and implementing procedure, considering gender mainstreaming for training program and environment for project planning 	Document Review Interview
Feasibility survey experts	<ul style="list-style-type: none"> - Conducting feasibility survey - Discussion on project implementation 	<ul style="list-style-type: none"> - Relevance of project - (EX) Appropriateness of project planning and direction 	Document Review Interview
Project management experts	<ul style="list-style-type: none"> - Supervising project design - Supervising construction - Overall supervision of project site 	<ul style="list-style-type: none"> - Relevance, effectiveness and efficiency - (EX) Appropriateness of project planning and direction, effectiveness of project design and construction, efficiency of drinking water facility construction 	Document Review Interview

4.2 Analysis of Lao Stakeholders

The Lao stakeholders are central, provincial, and district government officials, local design and construction companies, beneficiaries, and other groups as specified in <Figure 3-2> and detailed in <Table 3-4>.

<Table 3-4> Evaluation factors for Lao stakeholders

Stakeholders	Activities	Evaluation criteria	evaluation basis
Project implementing agency Laos MPWT	<ul style="list-style-type: none"> - Administrative support for licensing, project site, land compensation - Discussion on project implementation, recommending training candidates 	<ul style="list-style-type: none"> - Relevance, sustainability, cross-cutting issues - (EX) Relevance with Laos demands and needs, appropriateness of project implementation, project's self-support, Laos government support, legal and institutional changes 	Document review Interview VE workshop
Local KOICA office	<ul style="list-style-type: none"> - Processing Lao government requests, preliminary survey, discussion on project implementation - Monitoring project contract and outcomes - Conducting intermediate and end-of-project evaluations 	<ul style="list-style-type: none"> - Relevance, impact, sustainability - (EX) Appropriateness of project implementation and consultation, Laos cooperation 	Interview
LCG Ltd. (design company) Phoutpaseuth Const. Co. (construction company)	<ul style="list-style-type: none"> - Design - Construction 	<ul style="list-style-type: none"> - Relevance, effectiveness, efficiency and environment - (EX) Appropriateness of design and construction, effectiveness, considering environment 	Document review Interview VE workshop
Bolikhamxay water supply state enterprise Bolikhan district Nampapa	<ul style="list-style-type: none"> - Jurisdiction authority of project site - Project operation and management, maintenance and repair, capacity building, institutional enforcement, follow-up management 	<ul style="list-style-type: none"> - Impact, sustainability, relevance and effectiveness of training program, gender mainstreaming, environment - (EX) Project maintenance, needs of follow-up project, cross-cutting issues and impact 	Interview
Training candidates	<ul style="list-style-type: none"> - Participating in the training program in Korea 	<ul style="list-style-type: none"> - Impact from training program held in Korea - (EX) Effectiveness of technology and skill transfer 	Question-naire Interview
Local beneficiaries (7 villages in Bolikhan district)	<ul style="list-style-type: none"> - Project's primary beneficiaries 	<ul style="list-style-type: none"> - Impact, sustainability, training program's relevance, effectiveness and cross-cutting issues - (EX) Changes in life and perception, considering gender mainstreaming during project implementation 	Question-naire interview



Comprehensive Evaluation Results

Comprehensive Evaluation Results

This chapter derives comprehensive results from the evaluation model, collected data, and documents as mentioned in the previous chapters. The evaluation measures are the five OECD/DAC criteria and two cross-cutting issues: gender mainstreaming and environment.



1. Relevance Evaluation

Relevance Evaluation Factors

- Compliance with KOICA policies and priorities
- Compliance with recipient nation's policies
- Appropriate project planning
- Appropriate objective, duration, and budget
- Suitability of water purification facility
- Appropriate expert activities and equipment support
- Appropriate selection of trainees
- Appropriate project goal for construction of drinking water facility

○ Compliance with KOICA policies and priorities

KOICA provides aid for water crises in developing countries and has steadily increased grants related to the drinking water sector because the organization recognizes safe and clean water supply as a basic need necessary to sustain a healthy life. Since water for consumption and household use is correlated with health care and regional development plans - KOICA's main aid concerns

- the project fit well with KOICA's policies and preferences.

- Compliance with recipient nation's policies

The Lao government aims to increase access to safe and clean water with the NSEDP (2006-2010) and increase that access rate to 80% of the population with the NSEDP (2011-2015). As Bolikhan, the project site, is the First Priority Town (2006-2010) according to SIP, the project helps the Lao government reach its objective.

- Appropriate project planning

In the initial phase of the project, the Lao government requested a feasibility survey for drinking water development. However, preliminary results of the survey indicated that: ① there was an overlapping of feasibility surveys from other aid organizations that could diminish aid efficiency, and ② the budget allotted for the survey was not sufficient to cover the large area. Therefore, the project aim was adjusted to focus on developing and supplying safe and clean water. Although this modification was acceptable for Lao policies, the extensive needs of the beneficiaries were not fully reflected during project development and planning.

- Appropriateness of goal, duration, and budget

Previous reports indicated that the water sources used for consumption and household purposes in the area were contaminated or polluted. Therefore, the project's objective which was to increase residents' access to safe and clean water by installing water supply system is appropriate. The project's duration is also adequate according to the Laos National Development Plan, and the budget is within the limits.

- Appropriateness of water purification facility

Because of the high water quality and abundant water resources, the water purification facility could be constructed in Laos with fewer steps than in Korea. Additionally, high electricity costs and low labor wages led to the utilization of local resources and adaptation to local situations to save maintenance costs.

○ Appropriateness of experts activities and equipment support

After analyzing responses from interviews with local design and construction companies, it was determined that dispatched experts were competent and appropriate for their duties. Furthermore, the provided equipment was suitable for implementing and managing the project.

<Table 4-1> List of Provided Equipment

Items	No.
PC	2
Notebook	2
Laser printer	1
Inkjet printer	1
Fax	1
High-speed Copier	1
LCD projector	1
Digital camera	2
Scooter	2
SUV	2

○ Selection of trainees for training program

The training program ran for fourteen days from August 25, 2008 to September 7, 2008 with six trainees who were recommended by the Laos government. There were several issues such as overlapping trainees who were also participating in other training programs and trainees who were administrative officers instead of facility staff. In addition, as the training program was held in Korea, the impact of training was somewhat limited in providing more practical and direct guidance on facility operation and management. However, the program increases the positive image of KOICA and Korea among trainees and allows them to form professional relationships.

○ Appropriateness of drinking water facility construction

To efficiently supply clean drinking water, an additional drinking water facility was constructed after the completion of the water supply system. This was an adequate response to the need for high-quality drinking water in the area, because the drinking water facility depends on the water supply system and complement each other.

<Table 4-2> Relevance Evaluation Results

Outcome (short- and long-term)	Evaluation Criteria	Results	Evaluation Basis
Compliance with Lao policies	Construction of facility conforms with national development strategy	○	Document review Interview Training program report
	Experts' activities conform with national development strategy	○	
	Training program conforms with national development strategy	△	
Water supply system Drinking water facility	Project goal, duration, budget	○	Document review Interview Field survey VE Design drawing Project report
	Water collection method and facility placement	○	
	Facility size	○	
	Additional construction of drinking water facility	○	
	Equipment support	○	
Experts' dispatch Training program	Selection of dispatched experts	○	Document review Interview Training program report
	Selection of trainees for training program	△	

1. Evaluation criteria are selected based on representative nature
2. Results ○: Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
 △: Properly/generally accomplished/conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 × : Unsuccessfully/not accomplished/not conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 ※ Results are subjective and solely from analysis by the evaluation team



2. Effectiveness Evaluation

Effectiveness Evaluation Factors

- Overall goal achievement
- Supplying planned water quantity and constructing facility
- Training program effectiveness

○ Overall goal achievement

According to the end-of-project evaluation report, the rate of households with access to the water supply system increased from 0% to 68% (60.1% actual use). Thus, the goal of supplying safe and clean water was achieved. The questionnaire and in-depth interviews helped establish the project's positive contributions according to the beneficiaries' responses.

- The degree of satisfaction by the local residents was generally very high (88% responded satisfaction as relatively high or very high). Before the project, dug wells were the main source of water for household use excluding consumption (92.9% of respondents). After the completion of the project, only 50.3% maintained use of dug wells and 47.6% took advantage of the water supply system. The main source of drinking water changed from dug wells (80.1%) to bottled water (93.8%) after completion. The reasons residents prefer bottled water were convenience (33.3%), safety (31.4%), and reasonable price (30.2%). Through the water supply system and drinking water facility, local residents are able to access safe and clean water.
- The current operation rate of 30% for the water supply system needs to increase in order to meet the increased customer demand. The low usage rate comes from: ① the cost to install the water supply system to each household, ② residents who still utilize home wells and the nearby river although they are above the poverty line, and ③ preference for bottled water due to the perception that it is cleaner than water from the supply system. The preference for bottled water probably comes from local customs and unsanitary conditions around the water supply system. A standardization

of the water supply system site and education of the residents can change the misperceptions of piped water. During the second field survey, it was discovered that the chemical (chlorine) treatment odor discouraged widespread use of the water supply system. The suggestion is to decrease or eliminate the odor from the chemical (chlorine) treatment.

- Local residents stated during in-depth interviews that they trust the quality of KOICA bottled water because they feel that the two-step purification process– filtered first through the water supply system then through the drinking water facility– produces cleaner bottled water than just piped water.
 - The questionnaire indirectly verified that incidences of waterborne diseases (diarrhea) decreased as a result of improved sanitation surrounding drinking water. 74.6% of respondents answered that they had decreased incidents diarrhea. The decrease in hospital visits caused by waterborne diseases also supports the fact that overall incidents of diarrhea has been decreased. This indirectly showed the effectiveness of the project in terms of improving cleanliness in living conditions.
- Supplying planned water quantity and constructing facility
- The water demand estimations were made based on interviews with local government officials. The size of staff members for facility operation and management was found to be adequate. Also the 1,900m³ per day capacity level of the water purification system were found to be appropriate. As mentioned before, the current operation rate of 30% should be increased.
- The preliminary survey predicts that the population of the project area will be 18,383 in 2020 with a 2.2% population increase. The water purification system at full capacity (1,900m³ per day) and 96.8% operation rate can supply water to the entire population (at 100L per capita per day). The water facility meets current demand, and as of October 2012, the facility provides water to approximately 5,700 residents at a 30% operational rate.
- Training program effectiveness
- Due to issues in trainee selection and program contents, the short-term training

program in Korea was somewhat inefficient in transferring technological skills and capacity building. Although the training program contributed little to project effectiveness, it provided a networking opportunity between Korean and Lao officials, which contributes to strengthening relationship between the two countries. In addition, the trainees learned about Korea's advanced technology and water management techniques.

- The Vientiane water department conducts on-the-job clean water training on a regular basis. The Vientiane training consists of lab management, electric technology, pump management, water supply system management, computer skills, administrative services, etc. When they are correctly conducted, the local training programs can provide better results than the overseas training. The experts from Korea can train local experts in advanced skills and technology, but have problems running effective programs due to language barriers.

<Table 4-3> Effectiveness Evaluation Results

Outcome (initial)	Evaluation Criteria	Results	Evaluation Basis
Water supply system	Supplying planned water quantity	△	Field survey VE Interview
	Supplying safe and clean drinking water	○	
	Effective operation of drinking water facility	△	
	Financial contribution to facility operation	△	
Drinking water facility	Ensuring quality of bottled water	△	
	Usage of provided equipment during project	○	
	Usage of provided equipment after project	△	
Experts' dispatch	Achievement of experts' objectives (facility construction-related)	○	Interview Document review On-site interview Field survey
	Project implementation by experts (facility construction-related)	○	
Training program	Transfer of advanced Korean technology related to drinking water supply	△	
	Policy education related to drinking water supply	×	

1. Evaluation criteria are selected based on representative nature
2. Results ○: Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
 △: Properly/generally accomplished/conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
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 ※ Results are subjective and solely from analysis by the evaluation team.



3. Efficiency Evaluation

Efficiency Evaluation Factors

- Efficient project management, cost of construction, and labor input
- Communication among stakeholders during project implementation
- Efficient facility operation
- Efficient equipment support
- Language barriers preventing efficient project implementation
- Cost-effectiveness of drinking water facility construction

○ Efficient project management, cost of construction and labor input

Because PMC (K-Water) and PM allow efficient project implementation, similar cases of construction completed by local companies without PMC seem to be in poor condition. By comparison, the KOICA project was completed with a higher caliber of quality.

- PMC (K-Water) selected and managed design and construction companies for the project by conducting meetings on an average of two times per month. This was helpful in avoiding double contracts and guaranteeing full responsibility for repairing defects.
- According to PM, the size of the budget hindered the completion of landscaping and the laying of pavement. However, the first field survey indicated that landscaping (planting vegetation) to prevent landslides could be done on a small budget and minimal labor.
- There was only one PM for the project who had difficulty with language barriers and problems with lack of laborers. Despite these hardships, Lao officials expressed high satisfaction for the PM's management of the project. Additionally, a KOICA volunteer helped the PM in transferring skills and techniques with local staff.
- The water quality analysis lab located at Nampapa in Bolikamxai Province was established by KOICA in June 2012 with the donation of lab equipment, chemicals, support, and a KOICA volunteer to help it run efficiently. However,

compared to the Chinaimo lab, the one in Nampapa does not have the necessary equipment to test for E. coli and conduct other heavy metal tests, which limits its function as a water quality analysis lab. Because Nampapa has to commission Chinaimo to perform water quality checks on a regular basis, functioning water quality analysis equipment is needed in either Bolikhan or Pakxan, the capital of Bolikamxai Province, in order to run the water supply system and drinking water facility effectively. Additionally, a training program for the lab staff should be developed to improve their skills.

○ Stakeholder communication during project implementation

According to the 2009 mid-term report, the stakeholders, including the dispatched Korean experts, organized the Project Implementation Unit (PIU) to initiate project participation. The interviews with central and local government officials indicate that frequent meetings and cooperation among stakeholders increased the efficiency of project implementation. In addition, the PM mentioned that communication between the central and local governments was well-established for cooperation.

○ Effective facility operation

Although the facility operation is on the whole satisfactory, there are several factors preventing a more efficient operation of the project.

- Soil sliding: The loss of vegetation, caused by goats damaging grass, around the elevated water tank causes sliding of the soil on a slope in the rainy season. The soil sliding blocks the drains from functioning properly and raises the issue of safety of the elevated water tank <Photo 4-1>.
- Chlorine treatment facility: As of October 2012, the facility has been exposed to sunlight and not properly sealed, which decreases the effectiveness of chlorine. Therefore, the treatment should be moved inside to increase effectiveness of chlorine disinfection and staff training should be implemented to improve operation <Photo 4-2>.

- Water current admixture facility: There has been no proper repair and maintenance done on the water current admixture baffles, although they have been chipped off and broken <Photo 4-3>. Furthermore, the water passages were not protected from potential pollutants, because they were left uncovered <Photo 4-4>.



<Photo 4-1> Loss of slope soil due to lack of vegetation



<Photo 4-2> Exposure of chlorine treatment facility to sunlight



<Photo 4-3> Baffles chipped off and broken



<Photo 4-4> No protection from potential pollutants due to passage

- Efficient equipment support

Because the provided equipment was utilized properly, it increased overall efficiency of the project implementation.

- Cost-effectiveness of drinking water facility construction

The construction of the drinking water facility is assessed to be cost-effective considering the fact that it resulted in supplying safe and clean drinking water. Other effects are: ① creating employment opportunities for low-income families (indirect financial support), ② providing funds for water supply system installation for low-income families, ③ providing schools or hospitals with free bottled water, and ④ contributing to the autonomous operation of Bolikhan Nampapa from project documents and interviews with a KOICA volunteer.

- Although the 20L KOICA bottled water is in high demand, the inefficient delivery system prevents it from getting into the right hands. The reasons for this are: ① the lack of delivery vehicles, ② delivery focuses on large businesses rather than households, small stores, or small restaurants, and ③ broad target areas for delivery.

- Language barriers prevent efficient project implementation

Language barriers prevented effective communication during project implementation

and management, since the PM and government officials communicated in basic English while the PM and local construction companies had to go through KOICA volunteers who could interpret Lao. Some of the trainees who attended the training in Korea had such low English proficiency that it caused difficulties in running the program.

<Table 4-4> Efficiency Evaluation Results

Outcome (short-term)	Evaluation Criteria	Results	Evaluation Basis
Water supply system Drinking water facility	Scope of project and budget	○	Document review Field survey VE
	Efficiency of resource input and allocation of water supply system	○	
	Efficiency of resource input and allocation for drinking water facility	△	
	Cost-effectiveness of provided equipment (during project)	○	
	Cost-effectiveness of provided equipment (after project)	△	
	Efficient communication for project implementation	△	
Experts' dispatch Training program	Cost-effectiveness of experts' dispatch	○	Document review Interview Field survey VE
	Cost-effectiveness compared to other alternatives	○	
	Efficient running of training program (related to effectiveness)	△	
	Cost-benefit before and after training program (related to effectiveness)	△	

1. Evaluation criteria are selected based on representative nature
2. Results ○ : Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
 △: Properly/generally accomplished/conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
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 ※ Results are subjective and solely from analysis by the evaluation team.



4. Impact Evaluation

Impact Evaluation Factors

- Changes in social, cultural, and living environment after completion of project
- Impact of water supply facility construction on Laos, local beneficiaries, and stakeholders

- Changes in social, cultural, and living environments after the completion of project

The water supply system and drinking water facility not only enhance the image of the local area, but also positively impact the social and economic conditions. This can be seen indirectly by the population influx from neighboring areas.

- Questionnaire results reveal that local beneficiaries believe that their overall quality of life has improved, the time to collect water has decreased, and the incidence of waterborne diseases (diarrhea) has minimized. Although it is difficult to objectively compare these results before and after the projects due to the lack of basic data on healthcare and sanitation, the in-depth interviews and questionnaire indicate the positive impact on beneficiaries' lives.
- The main water collectors are adults (female: 64.7%, male: 28.6%, total: 93.3%), so the schoolchildren rate of absence is insignificant both before and after the project (absence before: 3.3%, after: 0.7%). For low-income families, there is only a payment plan for installing a water supply system and no other specific supporting policies are identified. In addition, financial support is needed to improve living conditions and hygiene.
- Because the local awareness of KOICA is low, increased public relations and improved KOICA bottled water delivery service are necessary to raise awareness of KOICA and generate project visibility. The strategies of other donor nations should be researched in order to implement the best strategy for this case.

- Impact of water supply facility construction on Laos, local beneficiaries, and stakeholders

The local construction companies mentioned that the project offered an opportunity for their technical improvement and increased their awareness and image of KOICA. In addition, the construction companies considered the local beneficiaries' interest and demands important. On the previous pages, the expected effects of drinking water facility are stated. However, as of October 2012, they are not generally realized due in part to a high estimation of profits generated from bottled water sales. Therefore, it is difficult to achieve all the stated goals.

- Institutional improvement of the recipient side is needed: issues with piped water rates and collecting system of public utility fees should be raised for fairness and transparency.

<Table 4-5> Impact Evaluation Results

Outcome (intermediate/ long-term)	Evaluation Criteria	Results	Evaluation Basis
Impact on Laos and policy	Changes of government agencies from facility construction	△	Interview Questionnaire
	Changes in Lao policy from experts' dispatch	×	
	Changes in Lao policy from training program	△	
Impact on stakeholders (beneficiaries and facility staff)	Changes in facility staff from usages of provided equipment	△	Training program Result report Questionnaire Interview
	Changes in trainees' lives due to training program	△	
	Incidence of diarrhea as of October 2012	○	
	Change in beneficiaries' life from facility construction (time and labor-input for water in-take)	○	
	Impact of project for low-income families	×	

1. Evaluation criteria are selected based on representative nature
2. Results ○ : Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
 △: Properly/generally accomplished/conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 × : Unsuccessfully/not accomplished/not conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 ※ Results are subjective and solely from analysis by the evaluation team.



5. Sustainability Evaluation

Sustainability Evaluation Factors

- Criteria and methods for facility maintenance and management
- Capacity building for facility staff
- Operation and management of drinking water facility
- Utilization of natural and local resources

○ Criteria and methods for facility maintenance and management

Upon completion of the project, a manual in Lao was prepared for the facility staff. However, the staff members do not properly refer to the manual for the maintenance issues. In addition, Bolikhamxay Nampapa examines water quality in Bolikhan on a regular basis and reports analysis results.

- According to the end-of-project report, suggestions for follow-up management are: ① expanding areas connected with water supply system, ② financial supports for low-income families for water supply system installation, and ③ offering educational programs about sanitation by dispatching KOICA volunteers.
- Bolikhamxai Province requests lab equipment at the Bolikhan water supply facility for water quality check. The Director of Chinaimo water quality lab states that the lab equipment will be used to test for E. coli and other issues. While Bolikhamxai Province uses underground water, the Bolikhan water supply facility uses more surface water and river water that must be tested.

○ Capacity building for facility staff

Capacity building is needed for the facility staff to operate and maintain sustainably. The staff's ownership and capacity can be strengthened through on-the-job training programs.

- The initial project plan included on-the-job training programs that were cancelled during the project implementation. Additionally, the central government

(MPWT) requests the on-the-job training before the completion of the project. Instead, the trainees are invited for training to Korea. Given this, developing training programs for the local staff are recommended for facility operation and maintenance.

- As mentioned previously, there is a request for lab equipment. Due to the current situation, training lab staff should be discussed as well as providing lab equipment for practical use of water analysis lab. Utilizing training programs from Vientiane water department is suggested. In case of Chinaimo, it utilizes the Vientiane water department programs and effectively runs the lab. Therefore, benchmarking Chinaimo can be an alternative for Bolikan water supply facility.

<Table 4-6> Sustainability Evaluation Results

Outcome (intermediate and long-term)	Evaluation Criteria	Results	Evaluation Basis
Sustainable supply of safe and clean water	Fiscal capacity for facility maintenance	△	Document review Questionnaire Interview VE
	Facility maintenance support from Lao government	×	
	Financial capacity for equipment utilization	△	
	Experts on equipment maintenance and repair	△	
	Plans for training hands-on workers	×	
	Applying knowledge from training programs	×	

1. Evaluation criteria are selected based on representative nature
2. Results ○ : Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
 △: Properly/generally accomplished/conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 × : Unsuccessfully/not accomplished/not conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 ※ Results are subjective and solely from analysis by the evaluation team.

○ Operation and management of drinking water facility

Most bottled water in Laos is priced at 3,000 kips. At first, KOICA bottled water was sold at 2,500 kips, lower than the market price, and the existing

business raised issues. As of October 2012, KOICA bottled water is being sold at 3,000 kips, the same as the existing market price. Also, the questionnaire results indicate that 46.9% of the respondents consider 3,000 kips for bottled water affordable while 2.3% of them consider it rather high.

Although KOICA bottled water is highly-trusted, poor delivery service limits its sales. Additional factors include lack of public presence and poor staff experience. Therefore, generating profits to become a self-supporting operation will be difficult for the drinking water facility.

○ Utilization of natural and local resources

Proper technology and materials were utilized for facility management and maintenance. For example, wooden baffles used in water current admixture are easily obtained locally. In addition, the sliding soil slope issues facing the elevated water tank can be readily fixed by planting vegetation (shrubs and grass).



■ 6. Cross-Cutting Issue Evaluation

Cross-Cutting Issue Evaluation Factors
Gender Mainstreaming - Reflection of the gender mainstreaming issues during project implementation - Impact of the project's gender mainstreaming
Environment - Reflection of environment issue during project implementation - Impact on the project's environment

6.1. Gender Mainstreaming

- Reflection of the gender mainstreaming issue during project implementation
 There is little data that suggests that gender mainstreaming issues have

been addressed in project implementation (project document). Because the KOICA guideline for gender mainstreaming was published in 2011, the issue was not discussed during project implementation in 2007. The evaluation factors for gender mainstreaming are outlined in Chapter VI so that gender issues can be assessed in future KOICA projects. According to the local government officials for the project, the main beneficiaries are females due to the decrease in labor and water collection time.

- According to local government officials, women spend over three hours on average carrying water from a source to a domestic water tank. However, the majority of respondents to a questionnaire (97.7%) stated that they spend less than 30 minutes to collect water from various sources like the nearby Namxan River, ground water, and wells.
 - Nevertheless, the project can have unintended, yet positive, impact on women's lives. For instance, when water levels and current speeds are high, women who are collecting water from rivers are in greater danger. The water supply facility decreases the possibility of a dangerous situation from arising.
- Impact of the project's gender mainstreaming

Through interviews with government officials and beneficiaries, it was found that they thought the project had a positive impact on gender mainstreaming but could not state it conclusively due to lack of supporting evidence. Consequently, the questionnaire found that 80.8% of respondents stated that they knew women who participated in the KOICA project. Because the participation of female workers in the workplace is high (98%), gender equality in Laos is considered to be stable, which a KOICA volunteer believes is due in part to political and matriarchal systems in the country.

6.2. Environments

○ Reflection of environment issues during project implementation

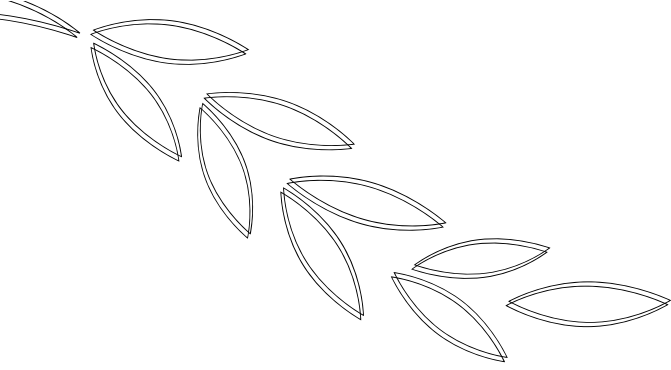
EIA seems little considered although the survey for water quality of surface and underground water is conducted during the project preliminary survey. The local government officers explain that environmental issues are considered. Yet there are few documents to support that environmental issues and public opinion from the beneficiaries are delivered. In addition, the local government officers have difficulty in outlining specific or long-term national environment strategies, which limits the evaluation.

- The project's preliminary survey did not find much to worry about in terms of environmental issues in the water quality of surface and underground water. While the local government officials state that environmental issues were considered, there is little evidence to support the idea that beneficiaries' public opinion on the subject has been considered. In addition, local government officials had difficulty outlining specific or long-term national environment strategies, which limits the evaluation.

○ Impact on project's environment

The majority of the responses to the questionnaire (98%) stated that the project had a positive impact on the local environment. However, in-depth interviews with beneficiaries found that they misunderstood natural environment as living environment (convenience). Nonetheless, the water supply facility was found to be environmentally friendly because it utilizes the river for its water supply system and does not release pollution.

- Because one of the main goals of developing nations is reducing poverty, development tends to be put before environment. This is also due to low awareness of the environment, lack of specific strategies for the environment, and little consideration of environmental issues on the part of local residents. Nevertheless, environment evaluation factors are provided in Chapter VI so that they can be evaluated for future KOICA projects.



Suggestions and Specific Strategies for Improving Project Effectiveness

Suggestions and Specific Strategies for Improving Project Effectiveness

Based on the results and analysis in Chapter IV, specific suggestions to improve the effectiveness, impact, and sustainability of the water supply system are provided. The feasibility of implementing such suggestions should be discussed among KOICA headquarters, KOICA local office in Laos, and the Lao government.

<Table 5-1> Specific Strategies and Suggestions for Project Improvement

Suggestions for Improvement		Detailed Strategy for Implementation	
Software Side	On-the-job training and capacity building of the facility staff	<ul style="list-style-type: none"> - Training by dispatched experts - Educational program for capacity building 	
	Perception change in beneficiaries	<ul style="list-style-type: none"> - Educating local residents to ensure piped water safety - Developing and providing educational materials on improving hygiene 	
	Financial support for installing water supply system	<ul style="list-style-type: none"> - Plans to provide financial support for low-income families 	
	Manual detailing for maintenance and management	<ul style="list-style-type: none"> - Drafting manuals and educating local staff for facility management (making it easy to understand in the Lao language) 	
Hardware Side	Providing equipment for water quality analysis lab and training	<ul style="list-style-type: none"> - Providing water analysis lab equipment for E. coli and heavy metal tests 	
	Improving the area around water supply system	<ul style="list-style-type: none"> - Standardizing surroundings of water supply system 	
	Drinking water facility	Improving facility roads	<ul style="list-style-type: none"> - Mending roads and laying pavement
		Mending slope sliding of elevated water tank	<ul style="list-style-type: none"> - Installing a fence and planting shrubs and grass
		Repairing chlorine treatment facility	<ul style="list-style-type: none"> - Moving chlorine treatment facility inside
		Repairing baffles at water current admixture	<ul style="list-style-type: none"> - Mending baffles at water current admixture - Sustainable maintenance plans
Blocking pollutants in water purification facility	<ul style="list-style-type: none"> - Installing floors or prohibiting trespassers 		



1. Software Strategy (Perception Change and Capacity Building)

1.1. On-the-job training and facility staff capacity building strategies

To improve efficiency in facility operation, technical training provided by KOICA volunteers and experts from Korea or local Lao experts is suggested for facility staff. The training focused on raising staff morale and elevating a sense of ownership to lead to self-improvement. Because dispatched Korean experts may have a low understanding of social and cultural norms as well as language barriers, utilizing local experts and programs can be a suitable alternative.

1.2. Perception change in beneficiaries and educational program on sanitation

The field survey and questionnaire predicted an increase in operational rates from the rise in trust of piped water, so developing sanitation education programs can affect the change. However, bottled water culture is not something that can be changed in Laos, so sanitation education should include information on piped water. Through these programs, the public image of Korea and KOICA can be strengthened.

1.3. Financial support strategy for installing water supply system in low-income households

Financial support plans can increase access to the water supply system for low-income families and others who may need it. Some suggestions for this include free installations, long-term interest-free loans, or discounted installations. Because the drinking water facility generates poor profits, the possible sources for funding are the Lao government, KOICA, or other aid organizations.

1.4. Preparation and use of facility management manual

Easily accessible manuals that can be readily understood by the staff should be provided for efficient and sustainable management. Additionally, upgrading or updating manuals using feedback can further improve maintenance levels and management.



■ 2. Hardware Strategy (for Facility Improvement)

2.1. Water quality analysis lab equipment support and installation

Providing a facility for water quality analysis lab and equipment can improve overall hygiene and facility management since currently E. coli and heavy metal testing are limited due to a lack of equipment and staff capacity. The estimated cost for the lab equipment is US \$6,000-7,000, excluding the costs for training staff to operate the facility. To improve operational effectiveness, the water quality analysis equipment should be installed in Pakxan Nampapa rather than in the Bolikhan facility.






2.2. Repairing water supply system and drinking water facility

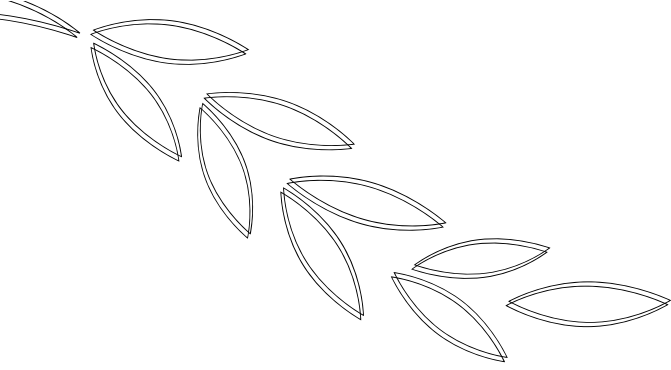
Comparisons between the original plan and alternative for improvements in water supply facility:

<Table 5-2> Comparisons between Original Plan and Alternative for Improvements

	Original Plan	Alternative
Improving area around water supply system	 <p>Proposal Background: Unsanitary environment around water supply system damages perception of piped water regardless of actual water quality</p>	 <p>Management Plan: Standardization in water supply system for each household to improve hygiene around the area</p>
Improving roads in facility	 <p>Proposal Background: Inconvenient passage for vehicles due to mud during rainy season</p>	 <p>Management Plan: Repairing roads and laying of pavement</p>
Preventing slope sliding of elevated water tank	 <p>Proposal Background: Due to goats causing vegetation loss, soil sliding leads to drainage blocks and safety issues.</p>	 <p>Management Plan: Planting shrubs and grass to prevent soil sliding and installing a wire-fence to stop goats from gaining access</p>

<Table 5-2> continued

	Original Plan	Alternative
<p>Repairing chlorine treatment facility</p>	 <p>Proposal Background: Installing chlorine treatment facility inside to avoid direct sunlight</p>	 <p>Management Plan: Moving chlorine treatment facility inside and seal from sunlight access</p>
<p>Repairing baffles in water current admixture</p>	 <p>Proposal Background: Although the baffles are constructed with easily obtainable materials, they easily break and chip</p>	<p>Management Plan: Educating and training staff to repair and maintain the baffles</p>
<p>Blocking pollutants in water purification facility</p>	 <p>Proposal Background: Pollutants can enter in the last step of purification due to staff movement</p>	 <p>Management Plan: Installing floor plates and change the prevent staff from walking near the purification area</p>



Conclusion and Recommendations



1. Conclusion

- Bolikhan Small Town Water Supply and Sanitation in Bolikhamxai Province Ex-Post Evaluation

KOICA conducted the Bolikhan Small Town Water Supply and Sanitation in Bolikhamxai Province project between 2007 and 2010. The ex-post evaluation assessed the project's outcome on relevance, effectiveness, efficiency, impact, sustainability, and cross-cutting issues according to OECD/DAC evaluation criteria. The evaluation measured the project's outcome and will allow KOICA to improve the effectiveness of similar projects in the future. Additionally, the ex-post evaluation can contribute to the advancement of the KOICA ODA project evaluation.

- The project provided a positive outcome, but requires some improvements
The Bolikhan project provided positive evaluation results overall, especially in relevance, effectiveness, efficiency, and impact. This project improved the livelihood of the local residents by providing a safe and clean water supply system, but there was little preliminary research conducted to address direct recipients' needs. Consequently, there were limitations on the planning, establishment, and implementation of the project as well as overlooking the cross-cutting issues: gender mainstreaming and environment. In addition, there was little support from the recipient nation after the project's completion and KOICA's weak exit strategy hindered the project's impact.

- (Relevance) The project matches KOICA's policies and priorities as well as Lao national development strategy of supplying safe and clean water. Although the project plan, goals, and timing are appropriate, the needs and demands of beneficiaries were not properly met. While the dispatch of experts and equipment support were found to be appropriate, the trainee selection process for the training program in Korea must be improved. The drinking water facility also agrees with the project goal even though it was completed as an additional part to the main project, construction of water supply system.
- (Effectiveness) The overall goals of the project were achieved and feedback from beneficiaries confirmed high satisfaction. The incidence of waterborne diseases was lowered as a result of the project's completion. The facility capacity is appropriate for the population level, but an increase in operation rate will be needed due to increase in demand for piped water. Although the Korean training was inadequate due to the short-term and standardized nature of the program, the positive experience for the trainees improved the image of Korea and Korean advanced technology.
- (Efficiency) PM improves efficiency of project management and implementation. Also, efficient communication among stakeholders facilitated project implementation. However, insufficient labor input and language barriers should be improved. Overall, the water supply facility is being run efficiently except for the few repairs which were needed: loss of soil from slope, chlorine treatment facility, baffles of water current admixture. Provided equipment and vehicles are being properly utilized. As a follow-up management, construction of the drinking water facility was cost-effective and efficient. Nevertheless, poor delivery service of bottled water should be improved.
- (Impact) The project had a generally positive impact on the social and economic environment of the local area. This has been confirmed by the population influx from nearby villages to the local area. Additionally, responses to questionnaires and interviews show that overall it increased

quality of life, decreased water collection time, and decreased incidence of waterborne diseases. The little financial support for low-income families limits the positive impact of the project, but overall the image of KOICA in Laos has improved.

- (Sustainability) KOICA and the Lao government provide little follow-up support for facility operation and management, and the limitations on facility staff size raise questions of sustainability. Consequently, the facility staff needs training to raise the sense of ownership and competency. To generate profits and become self-supporting, the drinking water facility needs to improve their delivery service of bottled water and promote public relations.
 - (Cross-cutting issues) Gender mainstreaming and environment were not reflected during project planning and implementation. However, this is because Laos is found to have high gender equality due to its political and social system. The Lao government officials did not specify a long-term strategy, but the facility is deemed to be environmentally-friendly.
- Suggestions for improving the project
- Based on the results of the evaluation, specific suggestions to increase effectiveness, impact, and sustainability in software and hardware are introduced. Hopefully, KOICA's headquarters, KOICA's regional office, and the recipient government may discuss the feasibility of implementing the suggestions. The most urgent improvements for the facility are: to ① provide funds for water supply lead-in construction for the poor ② standardize the model for maintenance of sanitary environment around water supply system and increase drinking water facility operational rate, ③ improve in and around road conditions for drinking water facility, ④ Decrease or eliminate odor from chlorine treatment, and ⑤ improve bottled water delivery service.
- Improving KOICA project management system to increase aid
- One of the constraints of evaluation was that job rotations among the staff

hindered efforts to obtain project documents. Therefore, an independent monitoring system is needed to enhance the process of project planning, implementing, and evaluating. An alternative is to organize a KOICA internal monitoring team or to hire an external consulting agency or consultant.



2. Recommendations

<Figure 6-1> Recommendations According to Project Implementation Procedure



- (During project planning) Systemic procedure to obtain baseline data
 - To collect accurate baseline data during the preliminary survey, future KOICA projects should set aside enough time.
 - Due to survey time constraints and inadequate management of statistical data in Laos, the precise number of households and population sizes could not be obtained during the preliminary survey.
 - The needs and demands of beneficiaries should be accurately assessed before setting project goals and objectives. Because the preliminary survey did not look at preference for bottled water in consumption and piped water usage for baths or laundry, the drinking water facility was constructed as a supplement to the main project. However, the facility allowed the project

to achieve the main goal, which is to supply safe and clean water for both consumption and household use.

- (During project planning and implementation) Educational programs for local beneficiaries

Educational programs should be developed for local beneficiaries during project planning and implementation to emphasize the importance of clean water and hygiene. This can also help increase facility operation rates by increasing demand.

- (During project planning and implementation) Need to reflect on cross-cutting issues

Considering cross-cutting issues such as gender mainstreaming and environment during project planning and implementation can improve overall quality of life and gender equality. Evaluations on gender mainstreaming and environment are excluded for the reasons mentioned in Chapter IV. However, <Table 6-1> and <Table 6-2> can be utilized to evaluate KOICA's future projects on gender mainstreaming and environment factors. Additionally, minority issues should be included in cross-cutting issues because in some places, ethnic minorities are reported to have limited access to water resources.

<Table 6-1> Gender Mainstreaming Evaluation Factors

Project Phase		Evaluation Factors	Results	Evaluation Basis
Project proposal and preliminary survey		1. Collecting and analyzing gender-specific data		
		2. Considering gender equality issues in recipient nation		
Activities	Water supply system	1. Participation of female stakeholders		
		2. Considering females during construction		
	Experts' dispatch	1. Realizing importance of gender mainstreaming		
		2. Considering gender-equality		
	3. Communicating with female stakeholders			

<Table 6-1> continued

Project Phase		Evaluation Factors	Results	Evaluation Basis
Activities	Equipment support	1. Considering female opinions on using equipment		
		2. Increasing equipment utility for female staff		
		3. Providing opportunities for female roles in management and operation		
	Training program in Korea	1. Equal participation of both genders		
		2. Gender equality during training program		
		3. Considering gender equality in training results		
	Drinking water facility	1. Gender equality status of beneficiaries		
		2. Considering female opinions for project		
		3. Female participation		
Intermediate evaluation		1. Collecting and analyzing gender-specific data		
		2. Utilizing gender-sensitive survey and analysis method		
End-of-project evaluation		1. Collecting and analyzing gender-specific data		
		2. Utilizing gender-sensitive survey and analysis method		

1. Evaluation criteria are selected based on representative nature
2. Results ○ : Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
 △: Properly/generally accomplished/conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 × : Unsuccessfully/not accomplished/not conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 ※ Results are subjective and solely from analysis by the evaluation team.

<Table 6-2> Environment Evaluation Factors

Project Phase		Evaluation Factors	Results	Evaluation Basis	
Project proposal and preliminary survey		1. Considering EIA during project planning			
		2. Surveying recipient nation's environment and considering national strategy			
Activities	Water supply system	1. Agreement between facility construction and recipient nation's environment strategy			
		2. Environmental impact after facility construction			
	Experts' dispatch	1. Dispatched experts' awareness of impact on recipient nation's environment			
		2. Considering environment-related opinions in experts' activities			
	Equipment support	1. Considering environment when providing equipment			
		2. Impact on environment when utilizing equipment			
	Training program in Korea	1. Including environmental issues in training program			
		2. Considering environmental issues in training results			
	Drinking water facility	1. Impact of drinking water facility construction on environment			
		2. Considering environment when running facility			
	Intermediate evaluation		1. Considering environment-related opinions from recipient nation		
			2. Considering environment during evaluation		
End-of-project evaluation		1. Considering environment-related opinions from recipient nation			
		2. Considering environment during evaluation			

1. Evaluation criteria are selected based on representative nature
2. Results ○ : Successfully/efficiently accomplished/conducted according to plans/goals/objectives now or in the future
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 × : Unsuccessfully/not accomplished/not conducted according to plans/goals/objectives with some/urgent issues occurring now or in the future
 ※ Results are subjective and solely from analysis by the evaluation team.

- (Project implementation, operation, and monitoring) Capacity building for staff through training programs

Because short-term programs with a few individuals are insufficient for technology and skill training, and systemic and sustainable development of training programs are needed. Practical training can raise staff competency in efficient operation and management.

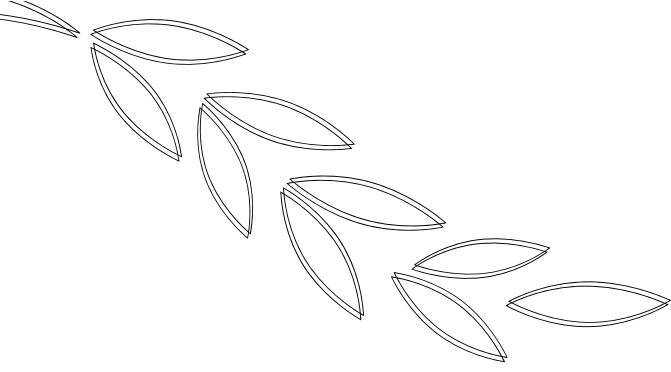
- (Project management and monitoring) Establishing KOICA's exit strategy

Despite the relative ease of operation and maintenance, the facility capacity is not at its full potential since KOICA did not provide follow-up management. A major part of KOICA's aid budget is allocated to project construction, which limits funding for follow-up management. Therefore, a separate portion of the budget should be allocated to increase sustainability of operation as part of KOICA's exit strategy. This should be discussed in relation to KOICA's policymaking and policy implementation.

- (Project operation and monitoring) Refrain from intervening in local private markets

Although facility operational rates, bottled water delivery service, and pricing can be improved in the short-term with efficient management, unnecessary competition with existing private businesses should be limited.

The facility can raise public interest and also minimize its impact on the local private market. In the long term, KOICA should encourage private bottled water businesses to improve their water quality and to conserve the local environment. By actively promoting the high quality of KOICA bottled water, other businesses will be stimulated to improve their own product quality. This strategy can help KOICA implement aid projects in the future.



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