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Ex-post Evaluation Report on the Project for Batheay Flood Control in Cambodia

한국국제협력단

KOICA

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Ex-post Evaluation Report on the Project for Batheay Flood Control in Cambodia

2013. 12

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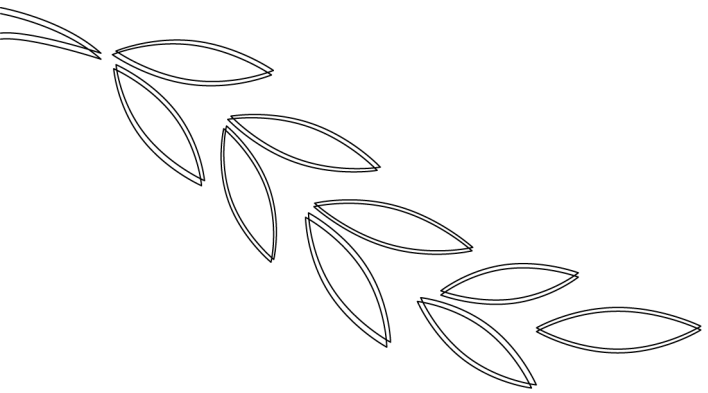
Abbreviations

AAA	Accra Agenda for Action
CAS	Country Assistance Strategy
CPS	Country Partnership Strategy
DEEP	Development Experience Exchange Partnership
FWUC	Farmer Water Users Community
ISF	Irrigation Service Fee
KGDC	Korea Global Development Consulting Center
KOICA	Korea International Cooperation Agency
MDGs	Millennium Development Goals
MoWRAM	Ministry of Water Resources & Meteorology
NSDP	National Strategic Development Plan
O&M	Operation and Maintenance
ODA	Official Development Assistance
PD	Paris Declaration
PDM	Project Design Matrix
PDO	Project Development Objective
PM	Project Manager
PMC	Project Management Consultancy
RGC	Royal Government of Cambodia
TL	Team Leader



Ⅰ. Evaluation Summary

Chapter

I Evaluation Summary

Two of the grant aid projects were carried out consecutively in the region of Batheay District, Kam Pong Cham Province, from 2007 to 2010: (1) the Batheay Flood Control Project (2007-2008, USD $2 Million) and (2) the Batheay Irrigation Construction Project (2009-2010, USD $2.5 Million). Three years have passed since the completion of the projects, and the projects are subject to ex-post evaluation according to the Development Cooperation Evaluation Guideline (November 2008).

The evaluation has been conducted to estimate the process and outcome of the projects in terms of relevance, effectiveness, efficiency, impact, sustainability and the cross-cutting issues - gender main-streaming and environment – focusing on effects and impacts. The effects and impacts derived from the project include not only direct but also indirect social, economic, institutional, environmental and other changes resulting from the activities. The flood control project and irrigation construction project were launched separately, but since they are strongly linked, the evaluation processes were conducted together. In addition, the evaluation matrix and research portfolio was established for the evaluation process.

The logic model for the evaluation was as follows: Input - Implementation - Output – Outcome. The preliminary research in Korea, field research in Cambodia and supplementary research proceeded step by step. Also, diverse methodologies like statistic and documentary research, interview, survey and on-site research were adopted for the evaluation. In addition, the Workshop in Cambodia and advisory committee meeting were held to confirm the reliability and objectivity of the evaluation result.

The first field research was scheduled in early September and the research team included Korean experts, two local consultant and researchers, a MoWRAM government official, and a KOICA evaluation specialist. During field research, the evaluation team had several interviews with diverse stakeholders in the project (governmental institution, local construction contractor, PMC, and the other relevant organizations), paid an on-site visit to the project area, conducted a survey on the direct and indirect recipients' group and held a workshop to share preliminary findings. After the first field research, to collect additional data in order to obtain a better evaluation result, Korean expert Mr. Lee Manho and the local researcher Mr. Lak Chansok performed additional field research and made 3 field visits during the end of October and early November. With this additional field research, the research team collected the relevant statistics of the project and performed a total inspection of certain developmental indicators in Sambo and Chea Lear Commune.

[Relevance] The flood control project in Batheay region has high relevance with the context of Korea's policy and strategy regarding Cambodia, the national development plan of Cambodia, the project objective, methodology, implementation and progression, and international development objectives and global standards. Furthermore, the irrigation project and the flood control project have the same project area and recipient group. The flood control and irrigation construction have high consistency with the regional and national development strategy. The development strategy of Cambodia and the Korean Country Assistance Strategy (CAS) regarding Cambodia place a high priority on agricultural development and water resource management. This project is the representative project to achieve this goal.

[Efficiency] The flood control project achieves maximum output with the minimum input under the goal of flood control and water resource management. Although the input factors and initial goal were modified in the project formulation and design step, the output of the project was still effective with the limited capital and project period. In addition, the experts and technology were appropriate for the project

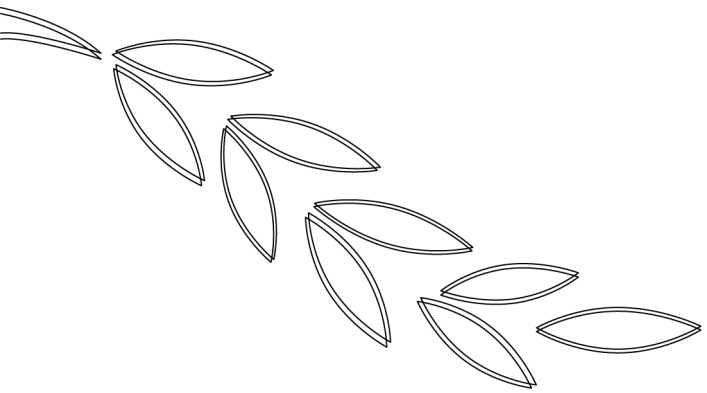
implementation. Compared with other similar projects, the efficiency of this project was high.

[Effectiveness/Impact] The basic project goal and short-term effect were well achieved through the effective input of project factors such as dike construction. Mid-to-long-term effects like flood control and water resource management were also shown. With the huge flood in 2011, several parts of the dike were damaged, but if the appropriate operation and management can be supported, the effectiveness can be guaranteed. Flood prevention and water resource management have ripple effects, such as stable and convenient agricultural conditions and improved household incomes. The increase in farmland price, medical service accessibility and school attendance rate were unexpected impacts derived from this project.

[Sustainability] The political sustainablity can be guaranteed since the Cambodian government is placing a high priority on the water resource management sector. Considering the damage from the huge floods in 2001 and 2011, the Project was designed in accordance to only 10-year probability of flood in the region. So, the sustainability of the flood control facilities can't be guaranteed as the permanent flood control system. Furthermore, it is necessary to repair the facilities that have become damaged from scouring or erosion brought about by rainfall and flood. MOWRAM supports repair only in cases of severe damage. As for damages which might recur year after year, such as laterite paving corrosion, residents need to repair and restore on their own. But it seems that they do not yet exercise sufficient ownership to engage actively in such activities.

The outcome of the Batheay flood control project has had a great impact considering the project input and limited budget. Diverse methodologies were adopted to achieve a reliable evaluation result, and direct and indirect goal achievement was shown. But the operation and management system after the project need to be complemented to ensure the sustainability. If the flood control

project and irrigation project were designed under the same programming agenda, the effectiveness and impact of the project could be maximized. Also, the soft elements for capacity building should be strengthened and the empowerment of development ownership should be considered for the participatory development. Thorough and intensive project preparation, flexible implementation management, and long-term solutions for sustainability can be another recommendation for a better project result.



Ⅱ. Background and Outline

Chapter

Ⅱ Background and Outline

1. Background and Flow of the Evaluation

Cambodia is one of Korea's strategic development partners, and the Korean government is committed to promoting a stronger economic and cooperative relationship with the Kingdom of Cambodia. Over the years, the volume of development cooperation with Cambodia has increased significantly, both in the form of grant aid and concessional loans. From 2007 to 2011, the volume was US$ 187 million, and 27 development projects were implemented under the channel of bilateral cooperation between the two countries.

The overall development goal of the Cambodian government is "poverty reduction and economic growth through the development of the agriculture sector."[1] The Rectangular Strategy of the Royal Government of Cambodia has established four pillars of strategic growth, putting the agricultural sector's development at the top of the national development agenda. Since Cambodia has abundant water resources and agricultural land, and depends heavily on paddy crops, the developmental potential for rehabilitating and enhancing the water management and irrigation system is one of the high priorities for national development and requires national investment in the future.

Agricultural and rural development is the first priority area of Korea's commitment to Cambodia through the development cooperation program. The Country Assistance Strategy 2008-2010 and the Country Partnership Strategy 2012-2015 for Cambodia put a greater emphasis on supporting the program of agricultural investment, especially

1) Royal Government of Cambodia, National Strategic Development Plan 2009-2013, June 2010

in the area of water resources management and irrigation. Accordingly, a number of projects have been implemented in these areas, including a reservoir rehabilitation project in Tamouk(2003), the integrated water resources development project in Kraing Ponley river(2007), and the feasibility study of Battambang Multi-Purpose Dam(2009).

With the following context, two of the grant aid projects were carried out consecutively in the region of Batheay District, Kam Pong Cham Province, from 2007 to 2010: (1) the Batheay Flood Control Project (2007-2008, US$ 2 Million) and (2) the Batheay Irrigation Construction Project (2009-2010, US$ 2.5 Million). Three years have passed since the completion of the projects, and those projects are subject to ex-post evaluation according to the Development Cooperation Evaluation Guideline (November 2008). The purposes of ex-post evaluation are (1) to improve future aid projects through feedback or lessons learned in the process of the project preparation and implementation, and (2) to provide a basis for accountability, including the sharing of information with the public.

2. Outline of the Evaluation

1) Project Outline

☐ Project Background

By constructing the dike for the flood control, the Batheay region will have strong potential for agricultural development through ensuring a stable water supply.

☐ Project Objective

Rural development and improvement of agricultural productivity by reconstructing the irrigation system and dike, and establishing a flood control facility

☐ Project Budget and Period

USD $2 millions / 2007-2008 (2 year)

☐ Project Area and Recipients

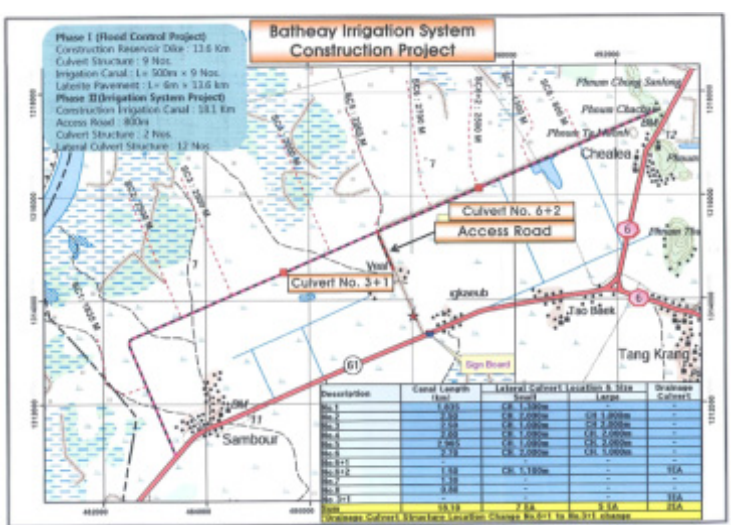
30,550 people, 20 villages, 2 communes in Batheay district, Kampong Cham

☐ Project Details

Basic and detailed design, construction of reservoir and water supply system, establishment of flood control master plan for Kampong Cham region, and Operation and Management (O&M) strategy for flood control, capacity building, etc.

[Figure 1] Location of the Project Area

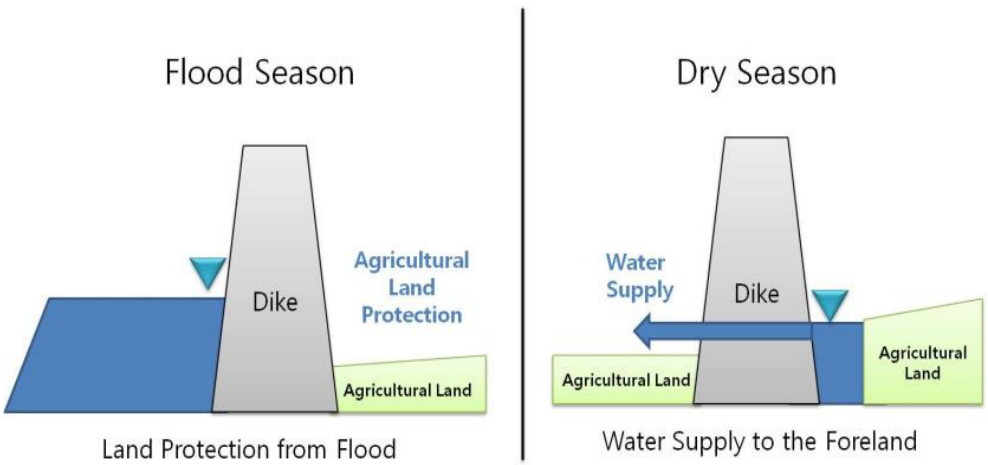
[Figure 2] Project Layout



<Table 1> Brief Outline of Flood Control Project

Categories		Contents	
Project Objective		Rural development and improved agricultural productivity by reconstructing the irrigation system and dike, and establishing flood control facility	
Responsi-bility	Korea	Construc-tion	Basic & Detailed Design
			Construction of Reservoir - Reservoir dike construction, Laterite pavement for the access road, Slope Protection (Sod or stone pitching)
			Establishment of Water Supply System - Culverts, Intake Structure, Canals, etc
		Experts Input	- PM/ 1 ppl/ 15 mths/ 3 field trips - Design and construction of reservoir and water supply system/ 1 ppl/ 7 mths/ 2 filed trips - Water Resource Management/ 1 ppl/ 4 mths/ 1 field trip * Selection and management of local construction contractor, Establishment of flood control master plan and O&M Strategy
		Equip-ment	Two four-wheeled vehicles
		Training Program	Water management sector (4 trainees * 7 days)
		Others	Preliminary study and operation meeting, Bidding, Interim and final evaluation
	Cambodia	○ Tax reduction and land compensation ○ Cooperation with the selection of local contractor ○ Support the experts' field trip, security guaranty and medical service ○ Recommendation of appropriate trainees for the training program	
Project Area		Batheay District, Kampong Cham	
Project budget and Period		2 million US dollar / 2007-2008 (2 years)	
Recipient group		30,550 people, 20 villages, 2 communes in Batheay District, Kampong Cham Province	
Desired Effect	Korea	○ Expert of water managing technology of a Korean company to and Mekong sub-region countries ○ Promoting the image of Korea and encouraging bilateral technical cooperation between Korea and Cambodia	
	Cambodia	○ Improving agricultural productivity (multi-cropping) and increasing household incomes with the flood control system ○ Stable water supply for Kampong Cham region	
Agency in charge	Korea	○ Korea International Cooperation Agency (KOICA)	
	Cambodia	○ Ministry of Water Resources & Meteorology (MOWRAM)	

[Figure 3] Project Concept



2) Objective, Scope and Focus of the Evaluation

(1) Evaluation Objective

Evaluation has been conducted to estimate the process and outcomes of the projects in terms of relevance, effectiveness, efficiency, impact, sustainability and the cross-cutting issues - gender mainstreaming and environment – focusing on effects and impacts. The effects and impacts derived from the project include not only direct but also indirect social, economic, institutional, environmental and other changes resulting from the activities.

(2) Evaluation Scope and Focus

This ex-post evaluation is a comprehensive review of the overall results of the project. Based on the end-of-project evaluation, this ex-post evaluation is focused on the mid-to-long-term achievements and effects. The logic model for the evaluation is as follows: Input - Implementation - Output - Outcome. The detailed scope and focus of the evaluation is suggested in Table 2 and 3.

<Table 2> Detailed Scope of the Evaluation

Category	Detailed Criteria of Evaluation	Contents of the Evaluation
Relevance	1-1. Consistency with the Policy and Strategy of the Korean Government	■ Relevance to Korea's ODA policy and strategy ■ Relevance to KOICA's Country Assistance Strategy (CAS)[2)]
	1-2. Alignment with the Development Needs and Strategy of Cambodia	■ Consistency with Cambodia's national development strategy, the Rectangular Strategy ■ Consistency with the developmental policy and strategy, especially for the agriculture and water resource sector, and project priorities
	1-3. Appropriateness of the Project Procedure: Preparation, Implementation, Operational Planning for the Project	■ Appropriateness of project selection ■ Rationality of the preparation, design and operational planning of the project ■ Appropriateness of the Monitoring and Post-management, and follow-up project
	1-4. Appropriateness of the Project Formation: Project Factors and Implementation Process	■ Appropriateness of the project factors' formation ■ Appropriateness of the project implementation process
	1-5. Consistency with the International Development Objective and Standard	■ Achievement of Millennium Development Goals (MDGs) ■ Aid Effectiveness in Paris Declaration (PD) and Accra Agenda for Action (AAA) ■ concerning about cross-cutting issues (environment and gender mainstreaming)
Efficiency	2-1. Timely Delivery and Appropriate Input of the Project	■ Appropriateness of the project schedule and implementation period ■ Project input with appropriate timing
	2-2. Project Management and Implementation of the Project Management Consultancy (PMC)	■ Appropriate project management system (budget, schedule, manpower) ■ Field management and risk management
	2-3. Cooperation and Communication among the Stakeholders, Project Monitoring	■ Smooth cooperation and communication with Cambodian side ■ Gathering public opinion from the direct recipient group ■ Appropriate Project Monitoring and Interim Evaluation
	2-4. Quality of Manpower and Efficiency of the Project Implementation	■ Professional competence of the experts ■ Active participation and cooperation of the experts

Category	Detailed Criteria of Evaluation	Contents of the Evaluation
	2-5. Comparative Analysis of a Similar Project as an Alternative	■ Case study of a similar project, like the Mekong river water resource development project
Effectiveness	1-1. Short-term Achievement	■ Attainment of the Project Development Objective (PDO)
	1-2. Mid-term Achievement	■ Expansion of the agricultural foundation ■ Improvement of agricultural productivity and household income ■ Improvement of quality of life for villagers
	1-3. Long-term Achievement	■ Contribution to agricultural and rural development ■ Poverty reduction, gender equality, social development, etc.
Impact	2-1. Impact on the Local Community and Residents	■ Change of awareness regarding development, social integration, ethical and cultural behavior in the local community after the project
	2-2. Institutional Change and Capacity Building	■ Development and improvement of the water resource and agricultural water management system
	2-3. Other Unexpected Impacts	■ Transportation convenience with the new road ■ Employment in non-agricultural sectors and income improvement ■ Increase in land price
Sustainability	3-1. Potential for Political and Institutional Support	■ Willingness of central and regional government to provide political and institutional support for the O&M of project
	3-2. Financial Sustainability	■ Capacity of the facility operation and management, and long-term re-investment ■ Appropriateness and sustainability of the Irrigation Service Fee (ISF)
	3-3. Technical and Entrepreneurial Sustainability	■ Operational capacity and technical maintenance
	3-4. Next Phase of the Project	■ Need for follow-up project ■ Phase-out strategy with the independent O&M

2) During the project period (2007-2008), "Country Assistance Strategy (CAS) 2008-2010" was applied for bilateral cooperation with Cambodia.

<Table 3> Detailed Focus of the Evaluation

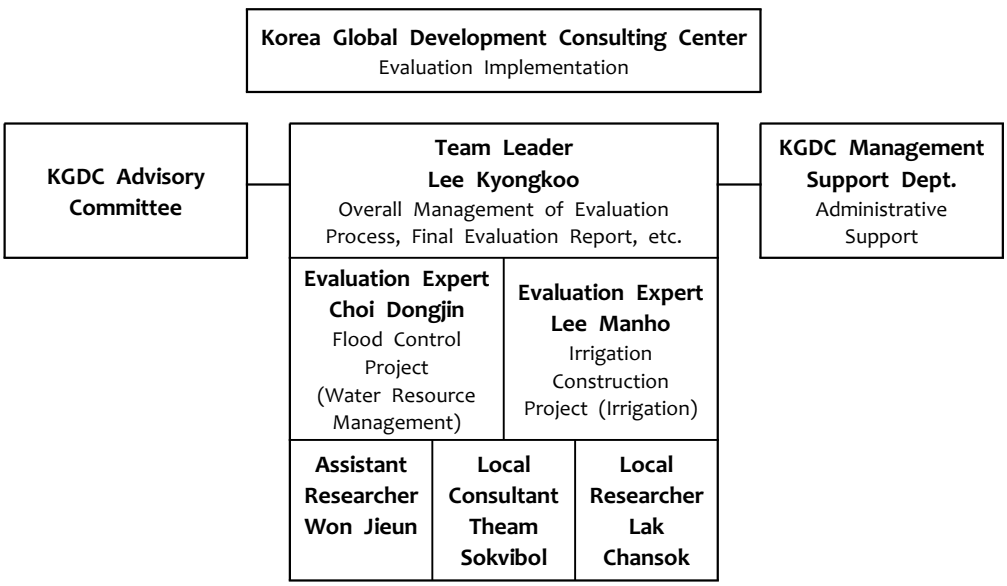
Achievement/ Effect	Contents
Short-term (Direct Outcome)	• Initial effect on the direct recipients - Dike construction, Strengthening of the agricultural foundation, Increase of agricultural productivity - Capacity building of the government officials in the area of water resource management and irrigation policy
Mid-term (Spread of the Project Effect)	• Effect on the direct/indirect recipients' group of the project - Contribution to the development of water resource management and agriculture sector - Capacity building of the relevant institution in the sector of policy, organization and system, etc.
Long-term (Ripple Effect)	• Ripple effects on the nation and society - Development of water resource and agriculture management policy, Encouragement of rural development - Poverty reduction, greater gender equality, and any other social developmental influence - Bilateral cooperation between Korea and Cambodia, Positive image of Korea as a development partner
Sustainability and the Other	• Sustainability of political and institutional support • Financial, technical and entrepreneurial independence • Project expansion and phase-out strategy • Satisfaction of the direct recipients with the project

3) Evaluation Team Organization and Evaluation Process

(1) Evaluation Team Organization

The evaluation of the flood control project was conducted with the evaluation of the irrigation system project, the follow-up project. To perform the evaluation, a team of 7 people was organized including Team Leader (TL), a specialist in the flood control and irrigation sector, research assistants and support workforce, local consultants and researchers. In addition, an advisory committee was organized to discuss the evaluation process. Notably, as the experts who participated in the project's preliminary study and operation meeting acted as members of the advisory committee, and the evaluation team could raise their awareness about the project's process.

[Figure 4] Evaluation Team and Job Description



(2) Evaluation Process

The evaluation process started with the inception reporting last July. As the first step, the research process in Korea was implemented prior to the field research. This process was for the document research and the interviews with main stakeholders in Korea. With the document review, the data about ODA policy and strategy for Cambodia, Country Partnership Strategy (CPS), project document and PMC project implementation plan, and the result of project monitoring and end-of-the-project evaluation were collected. The interview with core stakeholders proceeded for the KOICA Program Officer, PMC Project Manager (PM) and supervisor, etc. With these processes, the evaluation team can research the relevance of the project to determine whether the project is consistent with the policy and strategy of the Korean government, and the developmental needs and strategy of Cambodia, as well as whether the project has been conducted with the appropriate procedure. Also, in terms of the efficiency, the team can investigate the project input and output, project implementation and field management of the PMC, quality of manpower and technology, and implementation techniques of other projects for comparison.

The field research was scheduled for the 1st to 7th of September, and the research team included 4 Korean experts, 2 local consultants and researchers, 1 MoWRAM government official, and 1 KOICA evaluation specialist. During the field research, the evaluation team had several interviews with diverse stakeholders in the project (governmental institution, local construction contractor, PMC, and the other relevant organizations), made an on-site visit to the project area, surveyed the direct and indirect recipient group and held a workshop to share preliminary findings. During the field research period, the research team can collect ideas and feedback from diverse stakeholders and recipients. The workshop provided a great opportunity for both sides to share ideas and discuss the direction of the final evaluation.

After the field research, the evaluation team held an interim reporting seminar at KOICA. The team leader and experts shared the results of the field research and the draft concept of the evaluation, and got feedback from the chief of the evaluation office, evaluation specialist, program officer, etc. After the interim seminar, to collect additional data for better evaluation results, Korean expert Mr. Lee Manho and the local researcher Mr. Lak Chansok conducted additional field research and had 3 field visits at the end of October and in early November. With this additional field research, the research team collected the relevant statistics of the project and conducted a total inspection of certain developmental indicators in Sambo and Chea Lear Commune.

Ⅲ. Project Analysis and Evaluation Methodology

1. Project Analysis
2. Evaluation Methodology
3. Evaluation Matrix

Chapter

Ⅲ Project Analysis and Evaluation Methodology

1. Project Analysis

1) Analysis of the Country, Region, Sector Background

Cambodia is a typical developing country with ago-based economy. Around 84% of the nation's population, or approximately 13 million people, are working in the agricultural sector. 77% of the agricultural land is rain-fed paddy fields, and as these are solely dependent on rainfall as agricultural water, agricultural productivity and household income cannot be guaranteed in the event of a drought. Crop productivity is highly influenced by irregular rainfall. On the other hand, this means that Cambodia has huge developmental potential in the sector of water resource management and irrigation systems.

Of the 4 strategic developmental pillars suggested by the "Rectangular Strategy" and "National Strategic Development Plan"[3], the Cambodian government declared that the agricultural sector is the most critical sector to be developed, and specifically, has placed a strategic focus on increasing crop production. The effective management of agricultural water and land is required for the strategic development of rural areas and the whole nation.

3) Rectangular Strategy is national developmental vision of the Royal Government of Cambodia established in 2004. This strategy suggest four pillars of national development with the basis of Good Governance: ① nurturing agricultural sector, ② developing private sector and job creation, ③ rehabilitation and construction of infrastructure, ④ capacity building and human resource development. Based on this strategy, National Strategic Development Plan (NSDP) has been established.

The project area, Batheay region in Kampong Cham Province, is 44km away from Phnom Penh, the capital of Cambodia. This region is an appropriate area to perform the development project in the water resource management sector, as it is close to the Mekong river and Tonle Sap river. 20 villages, 5,650 households and 30,550 villagers comprise the direct recipient group for this project. The PMC of this project expected that it will contribute to alleviating poverty in the region by increasing crop productivity and household incomes. After the project's completion, in 2011, this area suffered huge damages due to a massive flood.

2) Stakeholders Analysis

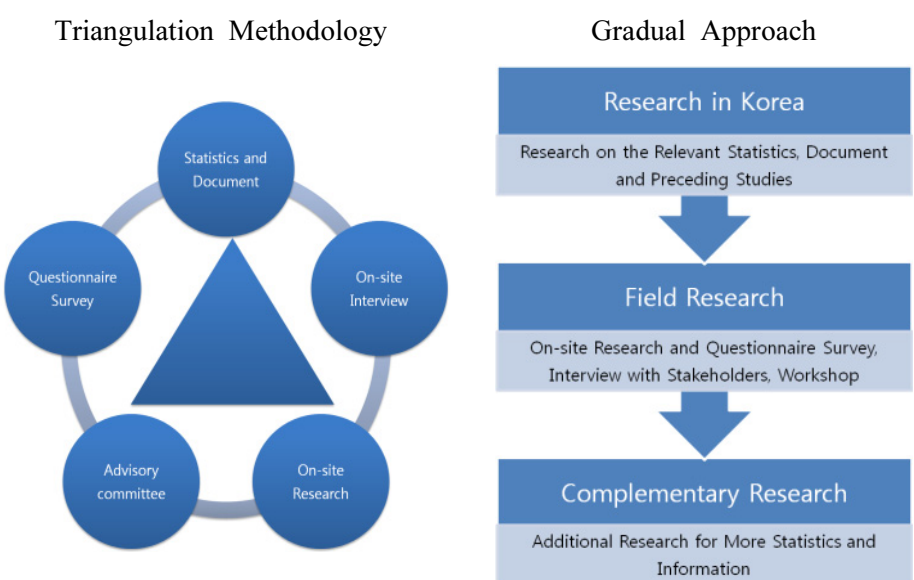
<Table 4> Classification of Stakeholders

Project Process	Stakeholders
Project Planning	■ Korean Side - KOICA Program Officer and Evaluation Specialist - Experts of project's preliminary study and operation meeting ■ Cambodian Side - Ministry of Water Resources & Meteorology (MOWRAM) - KOICA Cambodia Office
Project O&M	■ Korean Side - PMC (Yoosin Corporation) - CM - Experts on end-of-the-project evaluation - KOICA Regional Program Officer ■ Cambodian Side - MOWRAM - Local Construction Contractor - Participant in the end-of-the-project evaluation
Recipients	- Public Stakeholders (MOWRAM) - Local Residents in Campong Cham Province - Others (Cambodia Mekong Committee, etc.)

2. Evaluation Methodology

The logical model of this evaluation was established with the following flow: input- activity- output- outcome. In more detail, Triangulation Methodology was applied for the evaluation: statistics and document research, on-site interview and survey, advisory committee meeting, questionnaire survey, etc. In addition, the research process was implemented with a gradual approach. The detailed methodology can be visualized as shown in the figure below, and included (1) Literature research; (2) Data and statistics analysis; (3) Interview with policy practitioners and field workers; (4) Interview with local residents and beneficiaries; (5) Questionnaire survey of targeted group of stakeholders; and (6) On-site field trip and survey.

[Figure 5] Evaluation Methodology



3. Evaluation Matrix

1) Evaluation Matrix Frame

The evaluation matrix is composed of a research portfolio interwoven with six methods of survey and six categories of evaluation criteria, as follows.

<Table 5> Evaluation Matrix Frame - Research Portfolio

Evaluation Criteria	Document analysis	Data and Statistics analysis	Interview with policy practitioners and field workers	Interview with local residents and beneficiaries	Question-naire survey of targeting group	On-site field trip and survey
Relevance	○		○			
Efficiency	○	○	○			
Effectiveness		○		○	○	○
Impact	○	○	○	○	○	○
Sustainability			○	○		○
Contentment				○	○	○

2) Evaluation Matrix

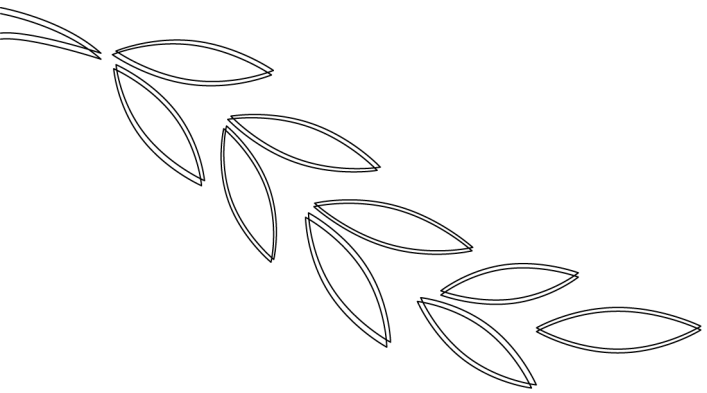
< Table 6> Evaluation Matrix

Category	Detailed Evaluation Criteria	Research Method
Relevance	Consistency with the policy and strategy of the Korean government	Document
	Alignment with Cambodian development needs and strategy	Document, Interview, Questionnaire
	Appropriateness of project goal and implementation plan	Document, Interview

Category	Detailed Evaluation Criteria	Research Method
	Appropriateness of project objective and implementation	Document, Interview
	Consistency with the international development objectives and standards	Document
Efficiency	Input and Output: Project Cost-benefit	Document, Interview, Questionnaire
	System of Project Implementation and Field Management	Document, Interview, Questionnaire
	Quality of Manpower and Technology	Document, Interview, Questionnaire
	Project Implementation Methods and Management	Document
	Comparative Analysis of Similar Projects	Document, Interview
Effectiveness	Accomplishment of Project Development Objective (PDO): Short Term Achievement	Document, On-site
	Contribution to the Development of Water Resource Management and Agriculture Sector: Mid Term Achievement	Statistics, Interview, Questionnaire
	Contribution to National Development: Long Term Achievement	Document, Interview
Impact	Impact on Local Residents and Community	Interview, Questionnaire
	Contribution to institutional and Capacity Development	Interview, Questionnaire
	Improving Bilateral Relationship and the Image of Korea as a Development Partner	Interview, Questionnaire

Category	Detailed Evaluation Criteria	Research Method
Sustainability	Political and Institutional Sustainability	Interview, Questionnaire
	Financial Sustainability	Document, Statistic, Interview
	Technical and Entrepreneurial Sustainability	Document, Statistic, Interview
	Expansion and Phase-out Prospect of the Project	Interview

Note: * Document= Document Research, Interview=On-site Interview, Questionnaire=Questionnaire Survey, On-site: Onsite Research



Ⅳ. Evaluation Results

1. Relevance
2. Efficiency
3. Effectiveness
4. Impact
5. Sustainability

Chapter

Ⅳ Evaluation Result

1. Relevance

1) Alignment with Korea's Policy and Strategy

(1) Consistency with Korea's ODA Policy and Strategy

The Flood Control Project subject to the ex-post evaluation had been carried out in the 1st Phase of Korea's 『ODA Mid-term Strategy』 : ODA Base Consolidation 2008-2010). The Strategy put a greater emphasis on strengthened cooperation with neighbouring Asian countries, including Cambodia, and categorized a number of priority areas for Korea's intervention in which Korea is believed to possess Sae comparative advantage. Cambodia was one of the 19 countries in the 2009 priority list of Korea's grant cooperation partners. Two of the seven priority areas are considered consistent with the rationale of the Project, and these are rural development and environment.

(2) Consistency with Country Assistance Strategy for Cambodia

『Korea's Country Assistance Strategy (CAS)[4] for Cambodia (2008-2010)』 identified four priority areas of engagement through KOICA's grant cooperation program in a medium-term perspective, and the top priority was agricultural and rural development. The Strategy specified water resources management and flood control as one of the prerequisites for the expansion of agricultural infrastructure, in order to ensure stable farming and productivity enhancement. Korea's new CAS for

4) The Country Assistance Strategy (CAS) was renamed the Country Partnership Strategy (CPS) when the 2nd Phase of Korea's ODA Mid-term Strategy was launched in 2010.

Cambodia 2012-2015 maintained a consistent policy priority for Korea's intervention by putting agricultural and rural development at the top of the priority areas.

2) Consistency with Basic Strategy and Needs of Cambodia

(1) Consistency with the National Development Plan of Cambodia

Water resources management through flood control has important implications that are relevant to the realization of Cambodia's national development plan and objectives. With the goal of enhancing "good governance" by the government, the Rectangular Strategy 2004 projected four sides of the "Strategic Growth Rectangle," pursuing (1) Agricultural Sector Promotion; (2) Private Sector Promotion and Job Creation; (3) Rehabilitation and Construction of Infrastructure; and (4) Capacity Building and Human Resources Development. The National Strategic Development Plan (NSDP) 2006-2010, which was implemented under the vision of the Rectangular Strategy of the Cambodian Government, put an added emphasis on the promotion of the agricultural sector in parallel with the better management of water resources and irrigation. The strategic focus of agricultural development in the NSDP highlighted the production of rice. The Project was in line with the national development objectives manifested in the Rectangular Strategy Phase Ⅱ (2009) and the Updated National Strategic Development Plan (NSDP) 2009-2013.

(2) Alignment with Sector Policy and Investment Priority

Two respective sector development plans were formulated in the policy direction of the Rectangular Strategy and the NSDP. Both the National Strategy for Agriculture and Water 2006-2010 and the Agriculture Sector Strategic Development Plan 2006-2010 identified the Flood Control Project in Batheay District as one of the preferred projects in the investment portfolio of water resources management and agricultural irrigation. The Pol Pot regime made the project an investment priority in the 1970s, and it was confirmed as one of the most immediate targets of development by the new Royal Government of Cambodia (RGC).

(3) Responsiveness to Needs of the Project Region and Recipients

While the Batheay region is basically endowed with favorable conditions for rice farming, the repeated flooding in wet season and droughts in dry season have meant that farmers lack a sufficient and stable supply of irrigated water. Floods cause a lot of damage, overflowing and preventing rice farming inside the dam during wet season. Most of the local residents as well as farmers had anticipated the construction of the dam and canals controlling the floods and supplying water for rice cropping. The Ministry of Water Resources and Meteorology (MOWRAM), in close collaboration with the local government of Kampong Cham Province, conceptualized the project of dam construction with laterite paving and canal structures with gate installation in the Batheay region. The Project was supposed to affect around 30,500 people in 5,650 families in 20 villages of the two communes: Sambo and Chea Lear.

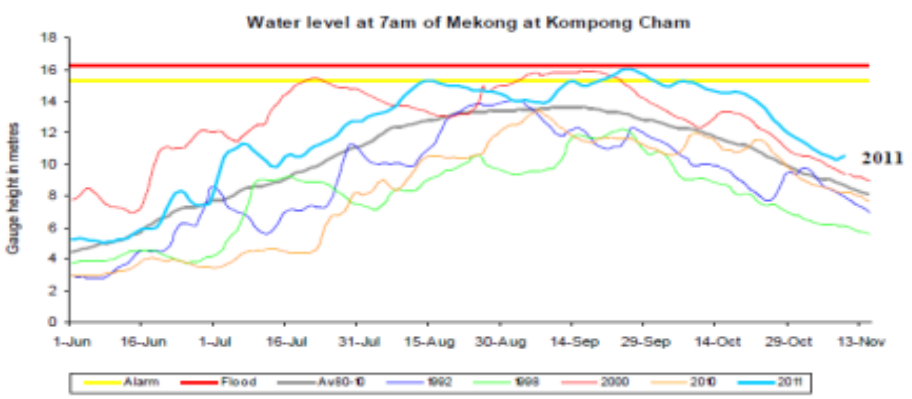
3) Relevance to Setting Project Objectives and Methodologies

(1) Rationale and Reality of Setting Project Objectives

Upon the projection of the National Strategy for Agriculture and Water 2006-2010 and the Agriculture Sector Strategic Development Plan 2006-2010 in 2006, the RGC identified the Flood Control Project as a demonstration project that could create visible outcomes in the area of water resources management and irrigation. MOWRAM, the responsible government authority, formulated the Flood Control Project in Batheay region with which a minimum small-scale investment could produce a maximum output, overcoming the low availability of public funds and the low level of technology. The size of the Project, which was designed based on the project proposal made by MOWRAM, was only US$ 2.0 millions to cover the critical components of the specified project requirements, but the objectives and project inputs of the Project were considered quite concrete and realistic.

After the completion of the Project in 2008, the region experienced a big flood in 2011. The flood was an unprecedented one and caused severe damage, partly demolishing around 450 meters of the dam, consequently overflowing the water into the inside of the dike. A data analysis found that in 2000 a similar size of flood occurred, which meant that the design standards of the Project were satisfying only 10-year probability of flood in the region. Even though it was not clearly stated in the documents of pre-feasibility study or basic design, it was believed that the designer had followed the local civil construction standards of road transportation in specifying the basic design criteria of the height of the proposed dam.

[Figure 6] Water Level at Kampong Cham Region



Sources: Cambodia Mekong Committee

In the stage of project identification and formulation, the scope of the Project was confined to the construction of the dam and main intake canal structures. It was evident that the dam was designed not only to provide flood protection, but also water storage and irrigation. It was believed that due to the budgetary constraints, the scope of the project identification and preparation was limited to the realm of flood control. It would be efficient, however, if a grand design or comprehensive master plan of the Batheay region had encompassed both the construction of flood protection and the system development of irrigation and agricultural promotion in the region. The initial study on the Flood Control Project should have incorporated

the second phase of the Project into the basic design, which was closely related with the preceding phase of investment for flood protection. Therefore, there were respective independent processes of separate pre-feasibility studies, and subsequently were different basic designs for both flood control and irrigation system development. The preparation and implementation of the Project were conducted by following the conventional programming approaches, and that was the mode of stand-alone project programming. These programming approaches are not considered eligible for ensuring a development cooperation which can be most effective. This is because the programming process is just pursuing a narrow span of development objective that produces only an instant and immediate effect on a single project-based outcome.

(2) Relevance of Project Components and Inputs

The detailed components and inputs of the Project were carefully identified and specified based mostly on the data and information given by the MOWRAM. The main components of the Project consisted of civil engineering works for constructing the dam and main irrigation canals. The Project included some policy and management consulting services such as the formulation of medium-term and long-term plans for flood control in Kampong Cham region and the development of an operation and maintenance (O&M) manual for flood control and irrigation facility management. By allocating some resources to capacity building in managerial technical manpower through training a number of government officials and technicians, the Project maintained a balance between the "soft" and "hard" components of the inputs. While soft project components reached 22.5 per cent in terms of the project cost, most were the expenses of Korean experts for implementing the Project. The proportion of soft expenses for recipient capacity building accounted for less than 1 per cent of the total project expenditures.

<Table 7> Composition of Project Components

Classification		Flood Control Project Cost	
		Amount($1,000)	Proportion(%)
Hard Component	Civil Works (Including site surveys)	1,500	75.0
	Equipment Provision	50	2.5
	Sub Total	1,550	77.5
Soft Component	Technical Consulting (Expertise, field management)	410	20.5
	Capacity Building of the Recipient	15 (Training Program)	0.8
	Other (Project preparation and monitoring)	25	1.2
	Sub Total	450	22.5
Total		2,000	100.0

(3) Analysis of the Stakeholders and Beneficiaries

In the course of project implementation, the process of project programming and site investigations were planned and executed mainly in terms of physical planning and technical feasibility. The site survey and analysis in the stage of project identification and formulation were dependent on the second-hand data and information given by the RGC, and a very short field trip for only a couple of days was possible due to the limited time schedule of 5-day pre-feasibility study in Cambodia. The evaluation team could not find the results of the stakeholder survey and analysis in the course of project preparation. It was considered in the course of project implementation that there should be close consultation with the leaders of the communes and villages in the project region. According to the results of the questionnaire survey, the opinions of the villagers were collected fairly and fed back into the project implementation.

(4) Projection and Operation of PDM and Performance Indicators

The Project Design Matrix (PDM) was not established in the course of project design and implementation. It is expected that a set of project goals and objectives are identified and the targets are to be specified into a number of verifiable performance indicators with means of verification. Only physical project targets of inputs and outputs appeared in the project document. The physical targeting figures such the length of dam construction and irrigation canals were amended by the modification of the project detailed design.

(5) Monitoring, Risk Management and Reporting

The planning and operation of monitoring, risk management and reporting were executed in the process of project preparation and implementation. The reporting of project progress and completion were made elaborate, punctual and appropriate in their contents and formalities.

4) Relevance of Project Implementation and Progression

(1) Project identification and Formulation

A formal request for the Project was made according to the procedures of the recipient's protocol, which confirmed the priority of the Project and the commitment of the RGC. Upon receipt of the project proposal, KOICA undertook project assessment and approval in close consultation with MOWRAM, the recipient agency of the RGC.

(2) Project Consultation and Implementation Planning

The Project Manual of KOICA clearly stipulates the step-by-step progress of the project's implementation. Based upon the project document mutually agreed between the two governments of the Republic of Korea and the Royal Government of Cambodia, Yooshin Engineering Corporation, the Project Management Consultancy (PMC), conducted a thorough site investigation that included a topographical survey,

geological investigation and site test.

A considerable change in the site conditions was identified and a round of design modification was initiated by adjusting the detailed project components and inputs to reflect the different site conditions. The volume of civil works for embankment was increased by 227 thousand metric tons, around 27.6 per cent. The surface area of sodding roughly doubled, from 68 thousand square meters to 130 thousand square meters. Unable to finance the increase in the project cost planned to be borne by the Korean side, the cost of stone pitching was borne by the Cambodian side. The reason why such modifications and adjustments were made could be explained by two shortcomings. The first one was the inaccuracy of the data and information provided by the Cambodian side. The physical conditions of the project site had been changed by soil erosions and topographical transformation. Futhermore, the information gained from local residents was incorrect in terms of technical precision. The second reason was that a basic site investigation had not been conducted in the course of feasibility study and project preparation. As such, a topographical survey and geological test are believed to be essential to this kind of civil engineering project.

<Table 8> Modification of the Project Development Objectives (PDO)

Classification	Unit	Record of Discussion(A)	Detailed Design(B)	B-A
Unsuitable Soil	Cm in depth	-	30	+30
Center Line	Meter	-	8.5	+8.5
Civil Works	1,000m2	822	1,050	+227
Sodding	1,000m2	68	130	+62
Stone Pitching	1,000m2	48 (Financed by Korea)	48 (Financed by Cambodia	Change of cost bearer
Intake Structure	Facility	8	9	+1
Canal	Meter	4,000	4,500	+500

(3) Selection of Project Execution Agency and Professionals

(PMC and Local Constructors) The Yooshin Engineering Company, one of Korea's renowned engineering consultant companies, was selected as the PMC of the Project. KOICA awarded the project to the Company in accordance with the process of consultancy procurement through competitive bidding. The civil works of construction were to be carried out by a local construction company. Based on the letter of intent from small and medium scale local construction companies, the PMC specified the scope of the works and the detailed terms of reference for eligible construction companies, and selected the construction company through a process of competitive bidding. Unfortunately the local company with a Koran entrepreneur was not able to complete the civil works because of financial difficulties caused by the Global Financial Crisis in 2008, and the construction company was changed to a local constructor with Cambodian nationality. The civil works were successfully completed by the replacement constructor, who owned his own equipment such as excavators, bulldozers, dump trucks and concrete mixers.

(Experts) Plenty of experts and professionals in the areas of water resources, hydrology, hydraulic, structural mechanics, road construction, environment, geology, project supervision, and accounting as well as project management were recruited for the implementation of the Project. Experts were employed for a total of 831 man·days, as scheduled, and additional manpower of 46 man·days for general management was provided in the stage of the final conclusion of the Project. The quality of manpower and technology applied to the Project were evaluated as superb in the sense that the experts and professionals who took part in the project implementation possessed a high level of knowledge and techniques, with rich experience in their related fields of expertise. However, the project team lacked experts in the area of irrigation and agricultural civil engineering. The Project might have needed some technical consultancy to ensure the efficacy of planning and implementation in the area of irrigation and agricultural engineering.

(4) Management of Risk and Stakeholders

The interviewees at the villages admitted that the visibility of the project implementation was apparent to the local residents of the project site. Because most of the project activities consisted of civil works, the progress of the Project had been exposed to the public view. The responses to questionnaires given to local residents made it clear that the opinions they offered were appropriately considered in the field works.

In dealing with the crisis caused by the bankruptcy of the local sub-contractor, the PMC made an opportune response by replacing it with a local constructor who possessed a competitive edge thanks to his ability to utilize his own construction and transportation equipment.

5) Consistency with the International Development Objectives and Global Standards

(1) Relevance to Millennium Development Goals (MDGs)

Even though the Project was not designed with the primary goal of achieving the MDGs, the objectives of the Project were expected to contribute to reducing the rampant poverty in the rural area, including the Batheay region, where the incidence of absolute poverty reached 35 per cent in 2007. The Project was considered as conducive to achieving the following MDGs: Goal 1 and Target 1.A - Eradicate extreme poverty and hunger; Halve, between 1990 and 2015, the proportion of people whose income is less than $1.25 a day.

(2) PD and AAA: Reinforce Recipient's Ownership, Aid Harmonization, Procure Mutual Responsibility, etc.

There was no statement regarding the assurance of aid effectiveness shown in the Paris Declaration (PD) in 2005 and Accra Agenda for Action (AAA) in 2008.

(3) Cross-cutting Issues such as Gender Mainstreaming and Environment

(Gender main-streaming) There was no evidence that gender main-streaming was obviously taken into account in project design and preparation. In the results, however, it was evaluated that the project itself had a positive impact on the role of women in development and the status of women.

(Environment) It was apparent that the Project itself was environmentally friendly. It was natural that the Project was exempt from environmental assessment.

2. Efficiency

The elemental purpose of a Flood Control System is to increase agricultural productivity and economic development in agricultural areas by way of modifying underdeveloped irrigation channels and embankments and constructing the flood control facilities to manage the water resources. Nowadays, in Cambodia's agricultural areas, agricultural water supply depends entirely upon reservoirs and rivers, but in dry season the water supply of reservoirs and rivers is depleted. Although reservoirs in upper stream rivers need to secure the water volume required in order to stabilize the agricultural water supply, the existing facilities have not been functioning. So people in agricultural areas have scarcely been able to cultivate any crops in dry season.

In the target area, all the land except roads are flooded in the flood season (from June through October), while the minimum required agricultural water supply has not been secured in the entire area except for low-lying grounds and artificial breeding facilities in dry season (from November through May). The extreme variance in the water supply between flood season and dry season seems to be a major cause of the

lowered agricultural productivity and subsistence level of local people in Batheay. This project is a very efficient one in terms of the input-output relation. The method that the project has adopted is not to construct new embankments, but to modify the existing embankments. As a result, the project maximizes flood control effectiveness by minimizing expenses. Through the site investigation, it is expected that if the irrigation system were to be improved, the crop yield and the cropping intensity would increase and the crop yield would be 5.4ton/ha (twice the current amount).

1) Input and Output Factors

In post-evaluation stage, the project team carried out a comparative evaluation about planned input-output which were determined under the arrangement of two countries. After starting the project, field survey and geological survey, the design procedure led to some modification of the plan because there was not enough data input from Cambodia. It has been clarified that the modified plan which had been adjusted to its modified condition had been faithfully carried out. The report written by the Cambodian side also clears up this point. But it is particularly noteworthy that additional input factors that occurred due to some modification of the plan were supplied by the Cambodian side. Cambodia bore a portion of the additional embankment engineering works expenses (stone pitching on sloping side of 40,800 ㎡) which occurred due to errors in the measurement survey.

<Table 9> Comparison of Plan and Achievements

Plans(R/D)	Main Achievements
○ Expert Dispatch : $ 410 thousands - PM : 15 months - Construction supervisor : 7 months - Water Resources Management : 4 months	○ Results - Total : 831 days - Survey & Design, FWUC Education - Construction & Supervision ○ Diary Expert : PM, Vice President :Kim, Kyu Tae(428 days) - 2007. 11.25 -2008. 04.26 : (154 days) - 2008. 05.12 -2008. 09.10 : (122 days)

<table>
<tr><th>Plans(R/D)</th><th>Main Achievements</th></tr>
<tr><td>- Survey & Design
- Construction &
supervision</td><td>- 2008. 09.26 -2009. 02.24 : (152 days)
Expert : Construction &
supervision, Director Kim, Jong Gab(403 days)
- 2007. 11.25 -2008. 03.12 : (109D)
- 2008. 03.28 -2008. 07.10 : (105D)
- 2008. 07.26 -2008. 11.17 : (113D)
- 2008. 12.10 -2009. 02.24 : (76D)</td></tr>
<tr><td>o Investigation:
- Survey
& investigation
- Soil Investigation</td><td>o Results
- 1st : 2007. 06 -2007. 11: Survey & investigation
- For Soil Investigation: 2 points were investigated. Because wet season started in July, investigation of the remaining 5 points were postponed.
2010
- 2nd : 2007. 12 –2008. 2: Completion of soil investigation for 5 locations.</td></tr>
<tr><td>o Design:</td><td>o Results
- Increased construction cost due to ground • elevation measurement error (60cm)
- Change of centerline (8.5m), request by Cambodian government to avoid invasion of private property

<table><tr><th colspan="2">Division</th><th>Original Plan</th><th>Revision</th></tr><tr><td rowspan="2">1) Embankment (㎥)</td><td>1st</td><td>335,500 →</td><td>487,200</td></tr><tr><td>2nd</td><td>487,200 →</td><td>562,983</td></tr><tr><td colspan="2">2) Top Soil(㎡)</td><td>244,800 →</td><td>292,990</td></tr><tr><td colspan="2">3) Sodding(㎡)</td><td>68,000 →</td><td>130,749</td></tr><tr><td colspan="2">4) Stone pitching(㎡)</td><td>12,240 →</td><td>-</td></tr><tr><td colspan="2">5) Geotextile(㎡)</td><td>40,800 →</td><td>-</td></tr></table>
- Pipe Culvert 7 sites→ 9 sites (At 1 location, 1 Pipe Culvert substituted for Intake Structure due to inhabitants' request)
- Construction of 8 irrigation roads for request residents (Cost : 1,116 million Won → 1,377 million Won)</td></tr>
<tr><td>o Construction :
$1,500 thousand
- Embankment 13.6km
- Drain Culvert : 7EA
- Intake : 1 EA
- Canal : 4km</td><td>o Results
- Embankment 13.6km
- Canal : 18.1km
- Drain Culvert : 9EA
- Intake : Cancellation 1 EA
- Canal : 4,500 m (500 × 9 EA)

o Diary
- Commencement of work : 2007. 6. 25
- Completion of work : 2009. 2. 25</td></tr>
</table>

Plans(R/D)	Main Achievements
○ Education : $15 thousands	○ Results - PMC : Check for detailed education plan, lecture and lecture note, and check for field training of FWUC - MOWRAM : Preparation of Itinerary for detailed education program for FWUC - Submission of education plan for FWUC : 2009. 08. 21 - Approval of education plan for FWUC : 2009. 09. 09 - Meeting of executive composition for FWUC (Total of 11)
○ Equipment : $50 thousands	○ Results - 2 Vehicles (4WD)
○ Other : $25 thousands	○ Results - Survey, discussion, interim and final appraisal, and project management, etc.

Source: End-of Project Evaluation Report on Project of Flood Control/Irrigation System Construction in Batheay Area, Kam Pong Cham Province, Cambodia

2) The Effectiveness of the Implementation and Management System

(1) Effectiveness of Management System

This project was developed at the request of MOWRAM and local residents, and during and after the implementation of the project, collaboration between the recipient government and project organization was secured. The central government (MOWRAM) and Kampong Cham Province government, Batheay District worked together well, and the central government bore some portion of the additional expenses.

(2) Effectiveness of Implementation System

An experienced local engineering company was selected as PMC, specialists in many different fields were put on the project, and the project moved ahead according to the schedule set within the design period. In the beginning stage, KOICA's local office and PMC and MOWRAM established a decision making and

collaborative system to discuss major issues. In the field survey stage, the project team collected verified data in cooperation with the Cambodian government, and worked to minimize the amount of survey work by using the existing reference data as much as possible. In the planning stage, sufficient discussions and consultative meetings with MOWRAM were held to perfect the plan. In the construction stage, taking climate factors into account, construction was set to take place in dry season and the construction plan was arranged as carefully as possible so that MOWRAM could proceed with land compensation work quickly. Under the intial plan, a Korean engineering company was expected to be PMC. However, considering the availability of local engineering personnel and equipment, the project team selected a local construction company as PMC.

(3) Transparency of Budget Execution Management

The global economic crises led to dramatic fluctuations in foreign exchange and the devaluation of the won. As most of the project cost consisted of foreign components, the budget execution process faced big challenges. But the construction bill was paid in time and the pay processing took place transparently and accurately.

3) Speciality of Profession and Adequacy of Technology

Specialists in many different fields were assigned to the project. However, the weak participation of the experts on agriculture and irrigation engineering left something to be desired. The following table shows the personnel input in each stage.

Korean technology has reached a world class level in the construction of retarding reservoirs and irrigation facilities for water supply, which has been generally carried out in Korea. PMC and local companies also had much experience in these engineering works, and had enough skill to meet the task. Unfortunately, due to the difficulty in procuring materials and budget constraints, soil was used as the building

material for embankments and roads, which is likely to result in the structures being damaged or carried away under flood conditions, and is a weakness in corrective maintenance.

<Table 10> Expert dispatched by Project Stage

Division		Experts
Project Programming	Project Planning	■ Project Plan - KOICA Project/Regional Development Team Project Manager
	Project Programming Project Implementation Discussion	■ Preliminary Survey Experts - Prof. Jung Gwan Soo (Civil Engr.) - Prof. Jun In Woo (Civil Engr.) ■ Project Implementation Discussion Experts - Dr. Park Sung Je (Water Policy) - Dr. Lee Byung Guk (Environmental Engr.)
Project Implementation Ex-post Management	Construction Supervision	■ PMC (Yusin Corp.) - Kim Kyu Tae PM, Kin Jong Gap - Flood Control Planning Expert - Water Resources O&M Manual Expert ■ CM - Mr. Kook, Mr. Lee (Water Resources Survey) - Mr. Sim, Mr. Seo (Hydrology) - Mr. Park, Mr. Hwang (Water Resources Design) - Jong Gab Kim, Yang Gwang Hyun (CM) - Byun Jong Kyu, Lee Kyung Hwhan (Structure Design) - Heo Tae Sung, Jung Byung Kweon (Road Design) ■ Training Management - Yusin Corp. Training Manager
	Project Evaluation Ex-post Management	■ End-of-Project Evaluation Experts - Kim Byung Kwan (KOICA) - Kim Kyu Tae PM (Yusin Corp) ■ Ex-post Management - KOICA Cambodia Management

4) Usefulness of the Execution Method and Execution Management

(1) Overview

KOICA headquarters took charge of making the project execution plan and KOICA local office took charge of the general management. The project office selected Incorporated Yooshin, who had sufficient skill and expertise, as PMC, and pushed ahead with planning and execution management.

(2) Usefulness of the Execution Method

This project was promoted through a basic plan and an execution plan; it did not include a feasibility study. Thus, it fostered efficiency by reducing expenses and execution term, but the lack of a Basic Design Study led to trial and error; that is, the fluctuation in the construction quantity and budget after execution. Although the scale was not large and a high skill level was not required, the way the project was implemented on the basis of a brief field survey left much to be desired. It would have prevented trial and error if the basic plan and the medium and long-term flood control plan for Kampong Cham had been set out before implementing the project.

(3) Usefulness of the Execution Management

By virtue of selecting Incorporated Yooshin, one of Korea's leading companies in building flood control systems, as PMC, the project was promoted without a major drawback. In the first flood controlling stage and the second irrigation canal building stage, which did not need a high skill level and involved a relatively simple process (building embankment and protecting bank, building concrete structure, road paving), the project was implemented properly on the basis of the skill level used in Korea and the accumulated experience in similar kinds of work.

5) In Comparison with Other Execution Method

The Cambodian government evaluated that 'Tamouk Reservoir Rehabilitation Project' and 'Multi-Purpose Water Resources Development in Krang Ponley River Basin,' which had been carried out previously based on the support of KOICA, had made a great contribution to the country's development. On the basis of this evaluation, the government asked for the implementation of this project. The purpose of this project was to secure the agricultural water supply in dry season by way of retaining the flood water in flood season, like other reservoir restoring projects that had been carried out in the past. It was intended for the land in the retarding basin to function not only as a reservoir but also as farm land. In other words, unlike the former projects, this project built an embankment, the purpose of which was to protect the farm area located in low-land in early flood season and to secure water supply for the farm area located in low-land and higher land in dry season.

The Cambodian government had confirmed the outcome of the Tamouk Reservoir project and had earnestly asked the Korean government to support this project. This was how this project could be started. In comparison with the Tamouk Reservoir Project, this project got good results, creating a larger area of added farmland and irrigable farmland. Also, this project gained a greater outcome than Tamouk Reservoir on the basis of input-output analysis.

<Table 11> Comparison with Tamouk Reservoir Rehabilitation Project

Project	Cost (Thousand $)	Added Irrigation Area	Supply Area
Tamouk Reservoir Rehabilitation Project(A)	1,360	400ha	1,500ha
This Project (B)	2,500	1400ha	4,000ha
Comparison(B/A)	1.83	3.5	2.67

3. Effectiveness

1) Goal Attainment

(1) Higher Goal attainment

The development of the agricultural region and increase of farmhouse income is required in Cambodia. Regular floods and droughts prevent stable agricultural production. In particular, the repeated flooding of Mekong river in rainy season and lack of water supply in dry season cause a vicious circle by decreasing agricultural productivity, maintaining farmers' poverty. This project is likely to cope with flooding damage in flood season and the lack of water in dry season simultaneously. To put it simply, it is a symbolic project that contributes to Cambodia's national development plan.

(2) Output Goal Attainment and Other Outcomes

The first flood controlling task attained the original goal, an embankment of 13.6 km in length, 6m in width and seven irrigation facilities and a water intake facility, irrigation canal of 4 km. According to the post-evaluation report submitted by Cambodian MOWRAM, this embankment project achieved the following results. In flood season, it protects 2,200 ha of farmland in the low-land from flooding and allows farmers to raise two crops a year, while in dry season it renders 3500~8000ha of farmland irrigable land and protects 9 villages and schools from Mekong river floods, offering traffic benefits to 20 villages with 5,650 households in Batheay District by road paving. In addition, this project strengthened manpower concerning flood control management, by handing over the technique required to investigate, design and build flood controlling embankments and irrigation canals. In addition, it established FWUC to pass on effective water resources maintenance and administrative techniques.

The embankments and roads, reservoir facilities, intake facilities, and irrigation canal which had been built through this project were functioning well. And the residents in this area have responded positively to the effect of this project. The project helped irrigation associations to organize successfully. But the residents do not yet have enough ownership of the project to operate and manage the irrigation facilities. MOWRAM evaluates that this project enabled double cropping in all the low-lands located within embankment. However, according to an interview with the residents, there are higher-lying lands and lower-lying lands in the protected low-land, and whether water can be supplied to the land or not depends on the height of the ground. This indicates that not all the farm land is appropriate for double cropping. In addition, using some area of farm land as a retarding basin sets limits on reservoir capacity and hampers the supply of water to all of the forelands in dry season.

2) Contribution to Water Resources Management and Agriculture (Mid-term Achievement)

(1) Infrastructure Expansion of Water Resources Management

This project protects villages and schools in this area from flooding damage and secures a stable water supply for agriculture. This project formed a detention basin with a water area of about 35㎢(14㎞×2.5㎞), and thus if it is 2m in depth, its detention storage is about 70 million tons. But except in flood season, not all of the low-land can maintain its role as a detention basin, and some areas should be used as farm land. Thus, this detention basin does not store 70 million tons. If different cropping periods were chosen for each farm area, the detention storage would increase significantly. The embankment is 11m in height, and the flood water level reaching above 16m can cause the embankment overflow. For example, in 2011 the flood water level reached 16.02m.

<Table 12> Water Level Table for Kampong Cham

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Max.of year	Date
2007	4.40	3.26	2.72	2.60	3.72	4.74	9.73	13.66	13.53	**14.52**	10.56	7.42	**14.52**	13.10.07
2008	4.63	3.47	2.90	2.82	5.96	10.23	11.56	**14.39**	14.08	12.94	9.99	7.92	**14.39**	14.08.08
2009	4.92	3.73	3.02	3.52	6.22	7.90	13.01	14.20	14.05	**15.16**	9.29	5.75	**15.16**	07.10.09
2010	4.15	3.41	2.62	2.65	2.97	4.09	8.19	12.46	**13.44**	11.96	9.04	6.34	**13.44**	06.09.10
2011	4.17	3.28	2.79	2.90	5.24	8.32	12.70	15.24	**16.02**	15.22	11.4	7.63	**16.02**	25.09.11
2012	5.05	4.12	3.39	3.16	4.63	7.68	10.28	12.76	**13.47**	11.50	7.14	5.11	**13.47**	06.09.12
2013	3.92	3.16	2.87	3.12	3.96	7.56	12.18	13.67						

Sources: Cambodia Mekong Committee

(2) Development of Agricultural Region

The positive effect of flood controlling task is well reflected in the before and after comparison of agricultural indicators. In 2012, various indicators which reflect agricultural development, such as multiple cropping, usage of farm machinery, rise of land price and usage of farmland show a rising trend compared with in the years before 2007. It can thus be shown that this project contributed to the development of agriculture, a core industry in the rural community. Table 12 below shows the details of this change.

<Table 13> Impact of Flood Control Project on Agriculture

Division		Unit	Before (2007) (A)	After (2012) (B)	Comparison (B-A)
Multi-crop	Double or Triple Crop	Rate, %	All farmers: Multi-crop		
Machinery usage	Rice Harvesting	Rate, %	10~20	40~50	30
Land Price	Chea Lear Commune(Village 1)	US Dollar	1,000~ 1,500	10,000~ 15,000	9,000~ 13,500
	Sambo Commune (Village 2)	US Dollar	2,500	30,000	27,500
Land usage (Agricultural Area)	Sambo Commune	Ha	150	500	350
	Chea Lear Commune	Ha	70	290	220

In addition, an increase of production and improvement of productivity led to increased incomes in the agricultural area. As a result, the living standard in the rural community was improved. This is confirmed by the fact that consumer electronics purchases and electrical facilities usage have increased.

This project has generally created positive effects in the mid- and long-term, such as improvement of various issues in various sections like social development. Increase of farmhouse incomes leads to the mitigation of the poverty of the rural area. As farming condition and living standard are improving, the time women spend caring for children and the opportunity for children to be educated are increasing. In the past, children would often be absent from school to help their parents to grow crops, especially when irrigating the rice field. Frequent outbreaks of floods also kept children from going to school. Now, the modified irrigation canals and increased income have reduced the demand for children's labor, allowing children to go to school.

It is clearly shown that as incomes increase, women have access to more medical services, especially during pregnancy and at childbirth. Also, the increase of the farming water supply has positive effects on vegetation and the protection of the environment.

The indicators concerned with general social development in the region are presented in Table 14 below. In the health care field, it is clearly shown that medical care utilization increases. In the education field, which only compares the number of students, it is difficult to confirm whether education becomes more accessible. But while visiting those schools, the researchers confirmed that the more money people had, the more often they sent their children to private schools in urban areas (such as Phnom Penh), instead of to public schools in that region.

<Table 14> Indicators for Social Development Impact

Indicators		Unit	Before project (2007-08) (A)	After project (2012-13) (B)	Difference (B-A)
Education	Sambo Primary School	Students (Girls)	879 (422)	628 (334)	-251 (- 88)
	Songkheurb Primary School	"	584 (257)	533 (248)	-51 (- 9)
	Songkheurb Secondary School	"	191 (99)	452 (216)	261 (117)
Clinic (Sambo Clinic)	Antenatal cares	Frequency	621	1,018	397
	Home(Traditional)	"	15	0	- 15
	Home(Clinic staff)	"	128	0	- 128
	Clinic	"	91	257	166
	Birth Spacing	Case	1,456	2,415	959
Others (Chea Lear Commune)	Television	EA	200	400	200
	Bicycle	"	220	205	- 15
	Motorcycle	"	230	300	70

3) Contribution to National Development

The National Strategic Development Plan in Cambodia (NSDP Update 2009-2013) presents six sectoral development plans. The third plan is the agriculture development plan and the fourth is the physical infrastructure reconstructuring and expanding plan. According to the fourth plan, the main priority has been given to water resources and irrigation system management, in which the top priority lies in flood control and drought control management.

This project made a great contribution to water resources management and irrigation system management by protecting farmland and villages from flooding in flood season and providing water which had been stored in detention storage

to farmland and villages in the dry season. In addition, it presented a model for the Cambodian government to make a plan for national water resources management by showing how to protect farmland at a small cost and how to use water resources efficiently. In many interviews with MOWRAM and local government officers, it was confirmed that they thought this project was more than simply embankment reconstructing work, and would be a model for water resources management, and a pilot project that was expected to be implemented in other regions in the future.

4. Impact

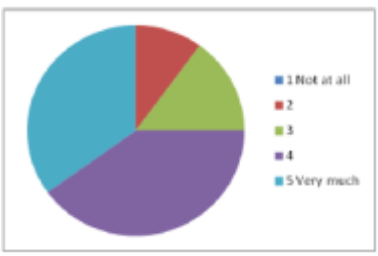
1) Impact on the local residents and community

This project had a remarkable effect on the community. First, it provided a way of supplying water to 3,500~8,000ha of farmland and created the opportunity for double cropping. Secondly, it protected nine villages and the schools within them, and provided a convenient traffic system for local residents. Thirdly, it is estimated that it makes a significant contribution to the development of the Batheay region, an increase in local residents' incomes and the mitigation of poverty in the local community.

In a survey of residents, 75 percent of respondents said that flood controlling work had lessened the flood damage. Also, all of the respondents said that half of their farmland had been protected from flooding, as shown in Figure 7 below.

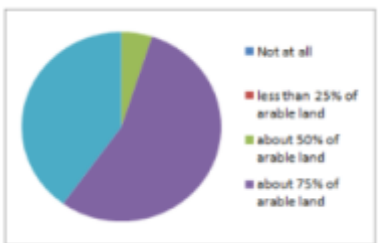
[Figure 7] Result of Questionnaire on Flood Control Project Impact

Do you think flood damage in your village has been reduced since the KOICA project finished?



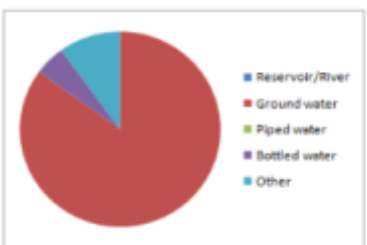
Response	Rpdent.	Percent.
1 Not at all	0	0%
2	2	10%
3	3	15%
4	8	40%
5 Very much	7	35%

How much agricultural land has benefited from KOICA's flood control project?



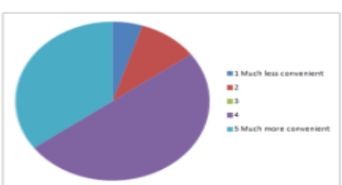
Response	Rpdent.	Percent.
Not at all	0	0%
Less than 25% of arable land	0	0%
About 50% of arable land	1	5%
About 75% of arable land	11	55%
100% of arable land	8	40%

What is the main source of drinking water?



Response	Rpdent.	Percent.
Reservoir/River	0	0%
Ground water	17	85%
Piped water	0	0%
Bottled water	1	5%
Other(rain)	2	10%

Do you think it is more convenient to get drinking water than it was before the project?



Response	Rpdent.	Percent.
1 Much less convenient	1	5%
2	2	10%
3	0	0%
4	10	50%
5 Much more convenient	7	35%

2) Improving System and Strengthening Capacity

This project helped to build up the mid-term and long-term Flood Control Plan in Kampong Cham by implementing a flood controlling task and writing up a guideline for the operation and management of the flood control system. In that respect, it can be evaluated that this project contributed to improving the system and strengthening the capacity in area of water resources management. However, it can hardly be said that the engineering work required for the flood control system itself contributed directly to improving the system and strengthening the capacity.

3) Cooperation between the Two Countries and Raising the Profile of Korea

This project had the effect of raising awareness of Korea among the local community, and the stakeholders and local residents hope to cooperate consistently with Korea. Above all, they hoped earnestly that the following irrigation system construction project would be executed with the support of the Korean government.

4) Other Unexpected Outcomes

As expectations among local residents grew, the price of farmland, especially farmland close to roads, increased. At that time, land prices were tending to go up everywhere in Cambodia. But according to the survey of residents, the land price in the target region rose even more steeply than in other regions. In this region, the land price went up more than ten-fold after the start of the project. But in some parts of the region, land price went down after the execution of the project. Some landowners sold their farmland to people outside the region, and tenant farming by local residents increased a little. Change in the land price in the region before and after the execution of the project is shown in Table 15 below.

<Table 15> Change in the Land Price of Sambo Commune

Year	Types of Land	Price
Before	Front Land	USD 1,500$/ha
	Middle Land	USD 1,000$/ha
	Back Land	USD 1,000$/ha
2007-2008	Front Land	USD 40,000$/ha
	Middle Land	USD 10,000-20,000$/ha
	Back Land	USD 10,000$/ha
2009-2013	Front Land	USD 40,000$/ha
	Middle Land	USD 3,000-4,000$/ha
	Back Land	USD 3,000$/ha

As flood damages were reduced, the local residents could engage in stable farming activities and seemed to feel strongly that their jeopardy in practical life was reduced. In an interview survey, local residents said that after the execution of the project the labor that might be required to evacuate livestock in preparation for flood in the past became unnecessary, and that while children of school age had used to only be able to go to school irregularly, they could now go to school regularly and their level of achievement in school had improved. In addition, it has been shown that parents felt more relieved when their children commuted to school than in the past.

5. Sustainability

1) Sustainability for the Policy Support and Institutional Support

The Cambodian government has consistently placed a high priority on flood control and water resources management. As such, it is estimated that it is likely that policy support and institutional support for the flood control system will be maintained. The government has paid continued attention to water resources management and rural region development, and maintained a consistent attitude regarding the policy concerned with those agenda. They classify irrigation facilities with an area of over 5,000Ha, such as this flood control facility, as key facilities for which the state should be responsible.

2) Self-sustained Growth of Finance

While the central government, in principle, should finance and manage this flood control facility, which is a state-run facility, the reality is that as a result of a lack of public funds, the government cannot provide sufficient financial support. From time to time, the government has provided immediate financial support to help residents recover from damages following a disastrous flood. But it is unclear whether they will consistently give financial support for the operation and management of flood control facilities. This is illustrated by the fact that the embankment that collapsed in 2011 has not yet been repaired properly.

3) Self-sustained Growth of Technology and Management

(1) Maintaining and Improving the Post Management Technology and Operational Competence

On the technological side, it is not difficult to maintain and manage the

embankment and the irrigation canal. So the community itself has the ability to handle this task, and organizations such as an irrigation association may function as the management system. But there are no personnel who have exclusive responsibility for the management of maintenance, and the role distribution does not reach the proper level.

(2) Operating and Supporting the Post Management System

It is necessary to repair the facilities that may be damaged from the scouring or erosion process caused by rainfall and flood. MOWRAM supports repair only in cases of severe damage. For damage that might recur year after year such as laterite paving corrosion, residents need to repair and restore it on their own. But it seems that the residents do not yet have the sense of ownership required to engage in such work actively.

4) Expansion of the Programme and Phase-Out

(1) Necessity of Expansion of the Programme

The aim of this project was to control flooding by building the embankment to the level of the existing roads. This means that the embankment would not provide sufficient protection in the event of great floods, such as the flood that occurred in 2011. Therefore, it is necessary to provide measures for such great floods.

When starting to plan, the project team might have decided to prepare for floods with which frequency would have taken account for designing the height of the dam and to set the design standard. It is thought that the measures to prepare for heavier floods than expected were not set up, and it was not confirmed how much water the region would require. This is why the failure of maintenance management occurred. It is necessary to determine how to handle great floods like the flood in 2011, as well as how to handle water supply shortage, and to make a plan. The

original plan seemed optimistic about the occurrence of big flood, though the reality was that this project could never prevent all types of floods; furthermore, taking into account the condition that some parts of farmland should be used as detention storage, not all of the forelands could allow multiple cropping.

The local residents require a system that could make irrigation supply stable enough to permit double cropping in all of the farmland. A counter-offer that was presented was to supply water to the reservoir by building and operating a pumping station in nearby Tonle Sap River. But this method had already been examined, however, wasn't endorsed by JICA (Japan International Cooperation Agency) because of the technological and financial difficulties. MOWRAM staff consider this method to be unrealistic from a financial standpoint. But to secure a permanent water supply, there is no alternative to this method.

Considering the reality that there is no way to achieve double cropping in all of the forelands, the best approach that would have a positive effect in the mid-term is to make a proper plan on how to use land, to make the residents aware of this reality, and to carry out reasonable farming activities. But the reality is that the residents expect that all of the water required should be supplied by other source of water resources in addition to the water reserved by flood. It is necessary to make a careful plan on how to efficiently use the flood plain and to induce the residents' active participation by cultivating their competence.

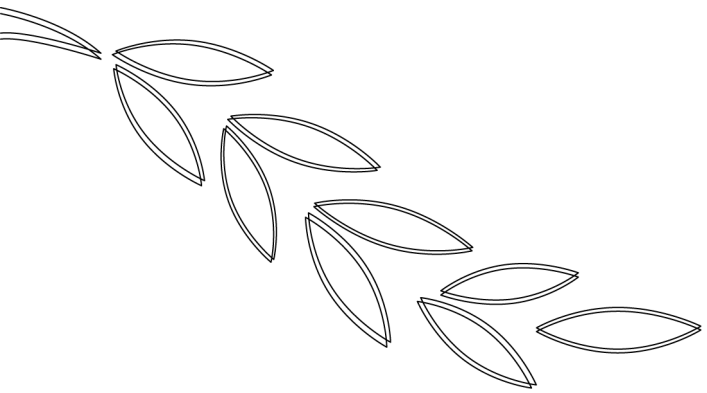
(2) Phase-out on the Basis of Self-management

After ending the project, the basis of self-management has been laid out by organizing the residents through the irrigation associations and providing lectures. The irrigation associations work relatively well. But the residents tend to rely on support from outside and lack the sense of ownership needed for self-management. Although they need to regularly repair the embankment and irrigation canal after the flood passes by each year, they merely hope for support from outside.

[Figure 8] Damage to Dike Road After Flood

It is necessary to help to strengthen their competence based on the experience accumulated in Korea. The ordinary responsibility of repairing and maintaining, managing the facilities or irrigating water from Tonle Sap river should be assumed by farmers' organizations, such as the irrigation associations.

It is desirable to focus on how to prepare for the heavy droughts that may be the result of climatic change and heavy floods beyond design frequency, and to execute a program that aims to strengthen residents' competence targeting the risk of flood and drought. Simply put, it is necessary to help irrigation associations work well and to set out the training programs for cultivating the competencies required to deal with flood and drought.



V. Conclusions and Recommendations

1. Conclusions and Lessons Learned
2. Recommendations

Chapter

V Conclusions and Recommendations

1. Conclusions and Lessons Learned

1) The Context and Rationale of the Project

(Strategic development partnership between Cambodia & Korea) Cambodia is one of the strategic development partners with which Korea has put a greater emphasis on promoting foreign, economic, and cultural relationship as well as development cooperation. Over the years the volume of development cooperation with the Royal Kingdom of Cambodia increased significantly, both in grant aid and concessional loans. From 2007 to 2011 the volume was USD $187 millions, and 27 development projects were implemented under the channel of bilateral cooperation between the two countries. Of these, 21 were grant cooperation projects, amounting to USD $34 millions, designed by the Korea International Cooperation Agency (KOICA), an arm of the bilateral cooperation agencies of the Korean government. The annual contribution of KOICA's development cooperation program for Cambodia was USD $23 millions in 2011.

(Cambodia's development goals & strategies) The overall development goal of the Cambodian government is 'poverty reduction and economic growth through enhancement of agriculture sector development.' The Rectangular Strategy of the Royal Government of Cambodia established four pillars of strategic growth, making agricultural sector development the single top agenda of national development. Agricultural development is placed in the center of Cambodia's developmental program (National Strategic Development Plan 2009-2013, Royal Government of

Cambodia, June 2010). Rehabilitating and enhancing irrigation potential along with water resources management is one of the high priority investment requirements for agricultural development. Cambodia's agriculture depends heavily on paddy crops, and the potential for expanding the irrigated farming area is great. The two core development strategies are being implemented in a paradigm of rolling plan and investment since 2005 in the targeted agenda of national development. Water resources management and flood control: The National Strategy for Agriculture and Water: 2006-2010. Agriculture and rural development: Agriculture Sector Strategic Development Plan: 2006-2010. The two strategies are updated and modified in an annual public investment program of each sector development plan.

(Korea's Development Cooperation with Cambodia) Agricultural and rural development is the first priority area of Korea's commitment to Cambodia's progress through development cooperation. The Country Assistance Strategy (CAS) 2008-2010 and the Country Partnership Strategy (CPS) 2012-2015 for Cambodia put a greater emphasis on supporting the program of agricultural investment, especially in the area of water resources management and irrigation. Accordingly, a number of projects have been implemented in these areas besides the two projects mentioned, including (1) A Reservoir Rehabilitation Project in Tamouk; (2) Integrated Water Resources Development Project in Kraing Ponley River; and (3) Feasibility of Battambang Multi-purpose Dam.

2) Efficiency

(1) Project Planning and Preparation

(Project formulation and design) The planning and preparation activities followed, according to the standard procedures of project-type cooperation. However, insufficiency was found in some specific activities of project preparation. Planning and design of civil engineering project requires a due basic site survey and preliminary analysis and study. The pre-feasibility study on this project was conducted in a

4-night, 5-day trip to Cambodia. This project lacked site investigation such as topographical and geological survey, soil analysis, etc. From this project, we learned the importance of basic study and survey in preparing an civil engineering project.

A substantial proportion of the project component consisted of hard inputs, and as such, the soft components such as technical, institutional and human capacity building received less attention in the design of the project. Considerations for empowering the recipient's ownership seemed less visible in the project planning and implementation. It would be better if soft components were taken into account in designing the project for building capacity of the recipient.

(2) Project Implementation

Even though there were modifications of the project design to reflect the changes in local physical conditions in the course of detailed design, the inputs and outputs of the Project proved to be highly effective in all components of the Project. The management system in the field was operated efficiently. The risks that occurred were ironed out through appropriate measures taken by the PMC. The level of professionalism of the employed technicians and experts was high enough in implementing the Project. However, it was found that there was a lack of expertise in the field of agricultural civil engineering and irrigation. In the planning stage, PDM had not been projected. Accordingly, the performance and tracking indicators of the Project were not developed appropriately. Furthermore, verifiable tracking or performance indicators were not modified in the course of project implementation and completion.

The projects were awarded with the currency set as Korean Won. There was a steep fluctuation in the exchange rate of Korean currency in 2008 and there was no flexibility in the risk management of the foreign component project cost. The contract document did not have an article covering this kind of risk management.

3) Effectiveness and Impact

(1) Attainment of the Project Development Objectives (PDO)

Attainment of both the upper and sector policy goals and development goals was considered as 'very satisfactory.' Most of the PDOs were achieved as planned, even though some of the project development objectives were modified to reflect the local conditions identified in the course of detailed design. It was evaluated that the short-term effect of the Project had been realized sufficiently, as had been expected in the planning stage.

(2) Medium-term Effect on Water Resources Management and Agricultural Sector Development

From the medium-term perspective, the Project showed visible results in improving the capacity of flood control and agricultural water supply. The direct effect of the Project was visible not only in water resources management and flood control but also in founding the base of agricultural productivity and infrastructure investment. Based on the positive results and the infrastructure brought about by the Project, the 2nd phase of the Project was conceptualized and proposed to be conducted subsequently in close connection with the Batheay Flood Control Project.

(3) Impact of the Project on the Other Arena

The Project was implemented as a first investment program in the region after the inauguration of the New Government in 2004. The survey results showed that the Project helped to raise a renewed awareness among local residents regarding international development programs. The questionnaire survey produced positive responses, both regarding the friendly relationship between the two countries and the image of Korea and Korean people. It is expected that an affirmative recognition of the efficacy of the Project might help induce some indirect effects of projecting a positive image of Korean companies in this area of specialization.

3) Sustainability

The policy commitment and institutional support of the RGC for the Project seemed to be consistent and strong. The current sector policy and program continued to place a high priority on water resources management and agricultural development. What might be certainly lacking in ensuring the sustainability of the Project was rather clearly recognized by most of the stakeholders in the Project. In particular, the financial sustainability is considered to be at risk due to the lack of funds for maintenance and after-care of the facilities. As the facilities for flood control in Batheay region are classified as state-run public infrastructures, the responsibility for the management of the facilities falls on the MOWRAM and the MOWRAM regional office in Kampong Cham Province.

Instead of phasing out the government intervention in the Project, a permanent solution is needed to address the intrinsic requirements for better control of flood and water resources management. In retrospect, the dam was designed to satisfy the intensity of flood occurrence every ten years on average, and the design standards are believed to be insufficient to control the floods in the years to come. In addition, simply ensuring protection against floods and retaining water in the reservoirs inside the dam is not sufficient to supply local farmers with agricultural water in a stable manner.

4) Recognition and Contentment

A questionnaire survey on recognition of the bilateral development partner for this project produced a modest result, showing that 16 of 20 questionnaire respondents composed of ordinary local farmers and residents were aware that the donor nation was the Republic of Korea. The other questionnaire survey conducted among the members of the Farmer Water Users Community (FWUC) who took part in the training program of the Project produced a different result, which showed a better

recognition of the donor nation. All of the 9 respondents answered that they had been aware that the government of the Republic of Korea was the provider of the Project.

2. Recommendations

1) Programming Approaches and Project Formulation

(1) Project Formulation by Program-type Programming Modality

The Batheay Flood Control Project was identified and formulated in accordance with the traditional aid modality of project-type programming by which a single free-standing, stand-alone project is selected and designed. The conventional method of project formulation was not able to effectively contribute to realizing a set of integrated development objective or target in a consistent and comprehensive manner. The single project-type modality of cooperation inevitably causes a substantial cost of transactions and fragmented management. A strategic operational program should be projected in a coherent approach by which a set of clustered programs comprising a number of related projects and developmental activities is designed to address a certain theme or agenda of a sub-sector or area in an integrated manner.

(2) Comprehensive Project programming

The composition of the Project was heavily dependent on the components of hard/physical infrastructure and external inputs, including civil engineering and foreign experts. Only a very slight portion of the project component was spared for the soft/capacity development portfolio of the Project such as policy consultation, human capacity building, and institutional and system development. Considering the limited financial resources, KOICA is advised to put a greater emphasis and higher priority

on the software components of policy, human and institutional capacity along with the expansion of physical infrastructure and hardware facilities. The newly introduced paradigm of technical cooperation, the so-called 'Development Experience Exchange Partnership (DEEP)' Program, in which further to policy consultation and strategy recommendation, a series of programs connecting to the projects of system development, institution establishment, professional capacity building and physical infrastructure construction, could be comprehensively identified and programmed in an integrated and comprehensive manner within an extended project or a sub-sector clustered program, needs to be adopted.

(3) Empowering Development Ownership and Participatory Development

The owner of the facilities constructed by the Project is primarily the MOWRAM of RGC; however, the assets are to be shared and owned by the local community. The routine operation and maintenance of the facilities should be mandated to the accountable authority of the local community. A guideline for the ongoing operation and maintenance of the flood control facility should be formed through close consultation among the main stakeholders of the Project.

The Project is differentiated from the 2nd phase of the project : the Irrigation System Construction Project - in terms of participatory development approaches. Without particular attention to participatory project planning and implementation of the Project, the results of a questionnaire survey on local stakeholders showed a rather modest understanding on the Project. This might be connected to a low commitment to the Project and less ownership of the Project in general. A pro-participatory approach based on the local community should be applied in project planning and implementation.

2) Sound Project Preparation and Flexible Implementation Management

(1) Thorough and Intensive Project Preparation

The Evaluation team found that the feasibility study on the project was conducted by a team of Korean experts within less than a week. Thorough and intensive preparatory activities such as pre-feasibility and/or feasibility study and basic design must be carried out in a more technically competent and sound manner that reflects the characteristics of the project. If necessary, the related surveys such as topographical investigation, soil analysis and testing, and geological survey must be included in the project preparatory activities. Planning and design of civil engineering needs a due basic site survey and preliminary analysis and study.

(2) Flexible Management of Project Implementation

Due to the less intensive project preparation there was some need to modify the project design, and to re-arrange the project development objectives and specific inputs. Some aspects of the project design proved not to be fully appropriate to the local physical conditions. Poor preparation usually results in some procrastination and change of division of labor, causing deficiencies in the quality of the civil engineering and construction. There was a steep fluctuation in the exchange rate of local currency in 2008, and no flexibility in the risk management of the foreign component project cost. The Asian economic crisis in 2008 depreciated the values of both local currencies: the Korean Won and Cambodian Riel. In addition, the price of oil rose by more than 50 percent, to 4,800 Riel per liter from 3,000 Riel per liter. The contract, which was based on the currency of Korean Won, didn't have an article related to this kind of risk management. Because of the fixed ceiling of donor's funding stipulated in the diplomatic arrangement - in this case, the Record of Discussion - there was little room for revision or modification. The funding agency should secure some reserves for flexible operation of the project in the event of unexpected change of conditions and design details.

The Project Design Matrix (PDM) had been projected in the planning stage, yet the PDM lacked sufficient concrete development objectives for the effective tracking of performance indicators. Usable tracking or performance indicators of the PDM were not developed or modified in the course of project implementation and completion. To manage the results, the PDM must have some concrete and measurable development indicators or performance targets, and these ought to be subject to modification to reflect the change of design and inputs during the progress of the project.

3) Projecting a Model Program for Controlling Flood

The project scored 11 points, reaching the echelon of 'Very Successful,' the stratum of highest performance. This means that the Project could be developed as a model pilot program in the area of flood control and water resources management of a small and medium scale project size. If a strategic operational plan is being prepared under the Country Partnership Strategy for Cambodia 2012-2015, a pilot program for flood control and water resources management might be developed and incorporated into a sub-sector program in the priority intervention area of agricultural and rural development.

4) Ensuring the Durability and Sustainability of the Project

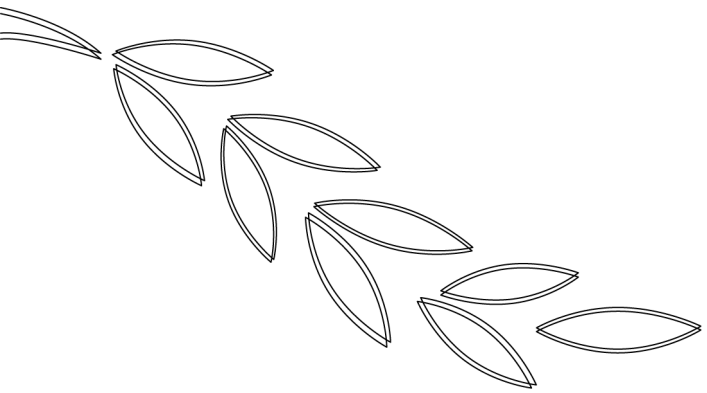
(1) Facility Operation and Post Management

It is observed that the Project and the management have shown little sign of medium durability and long-term sustainability. Neither the central nor the local government had a budget plan for operation and maintenance in the medium-term standpoint. The operational system and management of the project facilities did not receive due support corresponding to the policy and institutional commitment of the government. An immediate measure must be taken to ensure the medium-term durability of the project, particularly for routine system operation and maintenance.

The Evaluation Team recommends the preparation of an operation and maintenance (O&M) guideline for Batheay Flood Control Facility, as well as the allocation of an annual budget for post management of the facilities. Not only the governments but also villagers should take ownership and leadership in operation and maintenance. Farmers should consider the facility as belonging to them, and take good care to the extent that they are able in terms of operation and maintenance.

(2) Searching a Long-term Solution to Secure Long-term Sustainability

Concreteness should be emphasized in the construction of a project such as flood control, as without a concrete base, the structure is prone to damage and vulnerable to potential risk of big flood. In the event of a big flood, it is impossible to guarantee that the project facility will prevent flooding in the future. On the other hand, during seasons with low and small water, farmers do not have a sufficient amount of water to irrigate. It is recommended that an in-depth feasibility study to search for a fundamental solution for permanent flood control and stable water supply be conducted in the longer term perspective.



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Ray C. List, Development Evaluation in Times of Turbulence: Dealing with Crises That Endanger Our Future, The World Bank, April 19, 2013

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The World Bank, Paddy Irrigation and Water Management in Southeast Asia, E. B. Rice, 1997

Yooshin Engineering Corporation, Final Report: Batheay Irrigation System Construction Project, September 2010

Attachment

1. Ex-post Evaluation Questionnaire - An Integrated Version

KGDC KOICA

Ex-post Evaluation Questionnaire

An Integrated Version

On the Project of Flood Control and Irrigation System Construction in Batheay Area, Kam Pong Cham Province, Cambodia

I. Relevance

1. Alignment with Korea's Basic Policy and Strategy

1-1. Consistency with Korea's ODA Policy and Strategy

1-1-1. [Literature[1]] How does this project align with Korea's ODA policy and strategy?

1-1-2. [Literature] What are details of relevant information that align with Korea's ODA policy and strategy?

1.2 Appropriateness of Cambodia's Country Assistance Strategy (CAS)

1-2-1. [Literature] How does this project align with Cambodia's Country Assistance Strategy?

1-2-2. [Literature] What are the details of relevant information, and how are they related to newly established Country Partnership Strategy (CPS)?

2. Consistency to Basic Strategy and Need of Recipient Country

2-1. Consistency to National Development Project of Cambodia

2-1-1. [Literature] How does this project align with Cambodia's Rectangular Strategy?

2-1-2. [Literature] How does this project align with Cambodia's National Strategic Development Plan (NSDP)?

2-2. Consistencies with Cambodia's Water Resource and Agriculture Development Policy, and Project's Order of Priority

2-2-1. [Literature, Interview] How does this project align with water resource and agriculture development policy such as "The National Strategy for Agriculture and Water: 2006-2010" and "Agriculture Sector Strategic Development Plan: 2006-2010"?

2-2-2. [Literature, Interview] What was the order of priority of this project?

2-3. Responsiveness to Needs of the Project Region and Recipients

2-3-1. [Literature, Interview] How does this project align with regional development plan of Cam Pong Cham Province?

2-3-2. [Interview] What were the methods used to collect opinions of stake-holders? How were those opinions reflected on the implementation plan?

3. Setting Project Objective and Establishing Progress Method

3-1. Validity and Reality of Set Project Objective

3-1-1. [Literature] Was clear objective set?

3-1-2. [Literature] Was it adequately quantified?

3-1-3. [Literature] Was it realistic?

3-2. Composition of Project Components

3-2-1. [Literature] Were material, technical, socio-cultural, and humanistic components all harmoniously considered?

3-2-2. [Literature] Were soft and hard components well harmonized/balanced?

3-2-3. [Literature] Were components related to empowerment and improvement of the institution and capacity development adequately considered?

3-3 Analysis on the Stakeholders

3-3-1. [Literature] Was clear analysis made on the stakeholders?

3-3-2. [Literature] Was the result fully reflected in the process of establishing and implementing the project plan?

3-4. Projection of PDM (Project Design Matrix) and Performance Indicator

3-4-1. [Literature] Was PDM established during project planning phase?

3-4-2. [Literature] Were usable tracking performance indicators identified to be modified in the course of project implementation?

3.5 Monitoring, Risk Management, Evaluation and Reporting

3-5-1. [Literature, Interview] Was monitoring plan established well in order, and pursued as planned?

3-5-2. [Literature, Interview] Was plan for risk management established well in order?

3-5-3. [Literature] Were interim and end-of-the project evaluations pursued as planned?

3-5-4. [Literature, Interview] Was proper feedback regarding results of interim and end-of-the project evaluation provided?

4. Appropriateness of Project Formation and Implementation

4-1. Project Identification and Appropriateness of Selection Process

4-1-1. [Literature, Interview] Was project requested in proper manner and under recipient's ownership?

4-1-2. [Literature] Was there adequate base that underpinned propriety of selection process and the decision?

4-1-3 [Literature] Were project feasibility study and examinations implemented appropriately after taking its unique characteristics into consideration?

4-2. Appropriateness of Project Design, Consultation, and Preparation Process

4-2-1. [Literature, Interview] Were regional characteristics and basic conditions fully considered in the process?

4-2-2. [Literature] Were technological inputs (agronomical survey, BDS, Detailed Design, etc) used to design and establish project plan successfully implemented?

[1] Literature Research

4-3. Appropriateness of Selection of Business Operator, Subcontractor, and Regional Specialist

4-3-1. [Literature] Was selection of business operator properly carried out?

4-3-2. [Literature] Was selection of subcontractor properly carried out following its custom?

4-3-3. [Literature] Was establishment of construction supervision system and its inspection well-carried out?

4-4. Appropriateness of Stakeholders, Risk Management, etc

4-4-1. [Literature, Interview] Was there any conflict of interests ever erupted? If yes, was conflict resolution appropriate?

4-4-2. [Literature] What type of risks has emerged? Were appropriate responses made to resolute those risks?

5. Consistency to the International Development Objective and Global Standard.

5-1. Relevance to Millennium Development Goals (MDGs)

5-1-1. [Literature] Were due consideration on MDGs carried out during project formation, examination on feasibility study, and establishment of action plan?

5-1-2. [Literature, Interview] How did this project contribute to 8 targets of MDGs?

5-2. Paris Declaration (PD) and Accra Agenda for Action (AAA) (Reinforce Recipient's Ownership, Aid Harmonization, Procure of Mutual Responsibility, etc)

5-2-1. [Literature, Interview] How did this project contribute to reinforcement of recipient's ownership?

5-2-2. [Literature, Interview] Was aid harmonization –internal and external - achieved in the process?

5-2-3. [Literature, Interview] Was mutual responsibility assured in the process?

5-3. Crosscutting Issues such as Gender Mainstreaming and Environment

5-3-1. [Literature] Was gender main-streaming issue considered during examination of feasibility study?

5-3-2. [Literature] Was review on environmental impact considered during examination of feasibility study?

II. Efficiency

1. Input and Output: Project Cost-benefit

1-1. Comparison between Project Inputs and Outputs

< Projects of Irrigation System Construction>

1. Project enforcement and supervision of construction
2. Geological survey and soil analysis
3. Basic design
4. Construct irrigation system: irrigation canal, culverts, etc.
5. FWUC(Farmer Water User Community) on-site education

1-2. Project Input and Output in Terms of Planned Project Schedule

1-2-1. [Literature] Organize and apprehend expected outcome of input/output elements and actual outcome of input/output elements.

2. System of Project Implementation and Field Management

2-1. Efficiency of Project Management Structure and Cooperation System among Related Institutions

2-1-1. [Literature] Efficiency of the project management and coordination among relations organizations

2-1-2. [Literature] Efficiency of partnership with the recipient authority and implementing agency

2-1-3. [Literature] Efficiency of communications with beneficiary stakeholders

2-2. Field Management of the Prime Management Consultancy (PMC)

2-2-1. [Literature, Interview] Efficiency of field management system, and appropriateness of project implementation system

2-3. Procurement and Budget Execution

2-3-1.[Literature] Procurement and budget execution efficiency

3. Quality of Manpower and Technology

3-1. Technical Expertise and Professional Competence of Experts and the Management

3-1-1. [Literature, Interview] Technical expertise, professional competence of experts, and expert's adaptability and understandability of multicultural environment

3-2. Techniques and Technologies Applied

3-2-1. [Literature, Interview] Propriety of techniques and technologies applied

4. Mode and Methodology of Project Implementation and Progression

4-1. Timing of Project Inputs

4-1-1. [Literature] Appropriate timing of project inputs

4-2. Modification of PDM and Performance Indicator

4-2-1. [Literature] Appropriateness of modification method for PDM

4-2-2. [Literature] Appropriateness of modification method for performance indicator

4-3. Communication and Feedback with/from Stakeholders and Direct Beneficiaries like Local Farmers

4-3-1. [Literature, Interview] Appropriateness of communication and feedback method

4-4. [Literature, Interview] Monitoring, on-site evaluation, and feedback

4-4-1. [Literature] Appropriateness of monitoring, on-site evaluation, and feedback method

5. Comparative Analysis of Similar Project for an Alternative Option

5-1. Case Study of a Project Carried Out by Different Authority such as Cambodia Mekong Committee

5-1-1. [Literature, Interview] Comprehend similar cases and crosscheck our method with their ex-post

evaluation methods.

III. Effectiveness

1. Attainment of the Project Development Objective (POD)

1-1. The Attainment of the Upper Policy Goals and Development Targets

1-1-1. [Literature, Interview] Level of contribution to national development and economic development policy and strategy.

1-2. **Attainment of Planned Goals and Targets - Outcome**

< Irrigation System Construction Outcome >

1. Did geological survey, soil research, and basic design contributed to the Successful outcome?
2. How much of an improvement in technique has fellows participated in FWUC training program shown? Are they continuously used to help the community?
3. What areas have directly benefited from this project, and what is the estimated number of beneficiaries?

1-3. Effect on Rural Infrastructure Development in the Region

1-3-1. [Statistical Literature, Interview] Effect of field development shown through development index of water resource management, flood control, and irrigation system construction

1-3-2. [Interview, Field Survey] How did this project contributed to flood control? Was there any positive change after the project was carried out?

1-3-3. [Interview, Field Survey] How much of the farmland areas is protected from the flood?

1-3-4. [Interview, Field Survey] What specific functions do dikes have during flood season?

1-3-5. [Interview, Field Survey] Did the project contributed to stable supply of drinking water and agricultural irrigation?

1-3-6. [Interview, Field Survey] How much of an improvement has been made in water supply capacity in dry season?

1-3-7. [Interview, Field Survey] How much of a water supply capacity has increased through irrigation system construction project?

1-3-8. [Interview, Field Survey] How much of a stable agricultural water supply provided after irrigation system construction project?

1-4. Enhancement of Agricultural Productivity and Crop System

1-4-1. [Statistical, Literature, Interview] Effect of enhancement of agricultural productivity: double cropping, etc?

1-5. Increase of Rural Income and Improvement of Rural Living Standard

1-5-1. [Statistical, Literature, Interview] Increase in rural income, employment opportunity, and improvement of rural living standard, etc

1-6. Positive Contribution to Other Industries such as Inland Aquaculture Development

1-6-1. [Statistical, Literature, Interview] Promotion and development of inland aquaculture

2. Contribution to National Development

1. Promotion of Water Resources Management and Agriculture in National Level

1-1-1. [Literature, Interview] Promotion of water resources and agricultural development

1-1. Contribution to Poverty Alleviation, Gender Balance, Environmental Protection, Social Development, etc

1-2-1. [Literature, Interview] Long-run performance in poverty alleviation, gender balance, environmental protection, social development, etc

IV. Impact

1. **Impact on Local Residents and Community**?

1-1. Awareness on development and change in behavior

1-1-1. [Field Survey, Interview] Change in governmental attitude, behavior, and awareness on development?

1-1-2. [Field Survey, Interview] Was there any change in awareness on flood control and irrigation construction?

1-2. Influence on the Beneficiaries of These Projects

1-2-1. [Field Survey, Interview] Positive or negative responses from beneficiaries?

1-2-2. [Field Survey, Interview] Did any of the local residents get damaged from this project?

1-2-3. [Field Survey, Interview] What are the problems emerged during or after the project?

2. Contribution to Institutional and Capacity Development

2-1. Institutional and capacity development in the area of water resources management and agriculture

2-1-1. [Field Survey, Interview] Contribution to institutional and capacity development in the area of water resources management and agriculture

2-2. Cropping Structure and Irrigation Management System

2-2-1. [Field Survey, Interview] Contribution to cropping structure (double/triple cropping, etc) and irrigation management system construction

2-3. Other Institutional and Capacity Development

2-3-1. [Field Survey, Interview] Contribution to other institutional and capacity development

3. Contribution to Amicable Relationship between the Two Countries

3-1. Reciprocal Cooperative Relationship

3-1-1. [Field Survey, Interview] Contribution to establishment of reciprocal cooperative relationship between the two countries

3-1-2. [Field Survey, Interview] Did technological exchange in relevant areas increase after this project?

3-2. **Image on Korea and Korean People**

3-2-1. [Field Survey, Interview] Contribution to promotion of positive images on Korea and Korean people

4. Other Unexpected Impacts

4-1. Positive Impact: Development of Transportation Convenience, Energy Conservation Effect, Increase in Off-Farm Employment Opportunity, Etc.

4-1-1. [Field Survey, Interview] Positive economic impact (development of transportation convenience, energy conservation effect, increase in nonfarm employment opportunity, etc)

4-2. Impact on Household Affair Labor, Land Price, and Other Positive/Negative Impacts

4-2-1. [Field Survey, Interview] Social impact (household affair labor, increase in land Price, and other positive/negative impacts)

V. Sustainability

1. Sustainability of Policy and Institutional Support

1-1. Sustainability of Policy and Institutional Support from the Government

1-1-1. [Literature, Interview] Is there the sustainability of policy and institutional support from the central government?

2. Financial Sustainability

2-2. Financial Availability for Irrigation Facilities and System Management and Maintenance

2-2-1. [Literature, Interview] Financial availability for irrigation facilities and system management and maintenance

2-3. Self-sustainability of FWUC by Collecting ISP (Irrigation Service Fee)

3. Technical and Entrepreneurial Sustainability

3-1. Technical Capacity for Operation of the Facility and System, Forecast Improvement

3-1-1. [Literature, Interview] Technical capacity for operation of the facility and system, forecast improvement

3-2. Operation of After Service and Maintenance System

3-2-1. [Literature, Interview] Are operation of after service and maintenance system functioning flawlessly? Are damaged facilities being constantly repaired?

3. Next Phase of the Project

4-1. Re-investment and Expansion of the Project into a New Phase

4-1-1. [Literature, Interview] Need for the re-investment and expansion of the project into a new phase

4-2. Phase-out Handing Over to the Rural Community/Farmers Association

4-2-1. [Literature, Interview] Phase-out from the projects by handing over to the rural community/farmers association

2. Interviewee List

(1) Korean Stakeholders

Baek Sook Hee, Representative, KOICA Cambodia Office, KOICA

Chung Ki Whan, President, Korea Institute of Rural Development(KIRD)

Jo Young Taek, Project Manager of Cambodian Project, Yoosin Engineering Corporation

Kim Jong Gab, Construction Supervisor, former Department Manager, Yooshin Engineering Corporation(PMC Company)[cuttently Executive Director, Water Resources Department, Kunhwa Engineering & Consulting Co., Ltd.)

Kim Kyu Tae, Project Manager of the Project, former Vice President, Yooshin Engineering Corporation(PMC Company)

Kim Myung Lim, Vice President, Dohwa Engineering Company

Kim Won Tae, Professor, Department of International Trade and Business, Hanseo University

Kim Yonghwan, Deputy Director, Southeast Asia Team, Korea International Cooperation Agency(KOICA)

Lee Byung Kook, Chief Research Fellow, Division of Water and Environment, Environmental Policy Group, Korea Environment Institute

Lee Joo Heon, Professor, Department of Civil Engineering, Joongbu University

Lee Myung Hoon, Managing Director, Water Resources Engineering Department, Yooshin Engineering Corporation

Ryu Jeon-Yong, Director, Overseas Project Office, Korea Rural Community Corporation

Yoo Jee Hyun, Deputy Representative, KOICA Cambodia Office, KOICA

(2) Cambodian Stakeholders

H.E. Veng Sakhon, Secretary of State, Ministry of Water Resources and Meteorology(MoWRAM)

Chhun Kheang, Head, International Relations Department, MoWRAM

H.E. Ponh Sachak, Director General, Directorate of Technical Affairs, MoWRAM

Bak Bunna, Head, Water Supply and Sanitation Department, MoWRAM

Seok Hieng, Deputy Head, Department of Irrigated Agriculture, MoWRAM

Seng Sereyvitou, Department of Irrigated Agriculture, MoWRAM

Oum Vibol, Director, Department of Water Resources and Meteorology, MoWRAM

Yea Voeun, Deputy Director, Department of Water Resources and Meteorology, MoWRAM

Theng Bunteng, Department of Engineering, MoWRAM

Sek Hieng, Department of Irrigated Agriculture, MoWRAM

Theam Sokvibol, Senior Local Consultant

Lak Chansok, Junior Local Consultant

Ly Sok Heng, Lecturer, Royal University of Phnom Penh(RUPP)

Khieu Sunlong, Lecturer, Royal University of Phnom Phnh(RUPP)

Keo Soheat, Researcher, Cambodia Development Resource Institute(CDRI)

Sok Sothyra, Managing Director, PISNOKA International Corporation (P.I.C.)

H.E. So Sophort, Deputy Secretary General, Cambodia National Mekong Committee(CNMC)

Lor Chanly, Batheay District Governor

(3) Local Residents and Beneficiaries

Korn Kan, Chief, Chea Lear Commune
Korn Nga, Chief, Chea Lear Village
Nga Chhay Leang, Chief, Sambo Commune
Chim Cheurn, Tapay Villager, Sambo Commune
Cheung Sok Chans, Villager/Farmer, Sambo Commune
Inn Som Ol, Farmer, Sorngkeurb Village
Kim Luy, Farmer, Sorngkeurb Village
Som Nan, Farmer, Sorngkeurb Village
Chum Nith, Farmer, Sorngkeurb Village
Chorb Thol, Farmer, Sorngkeurb Village
Chim Meoun, Farmer, Sorngkeurb Village
Thoeun, Farmer, Sorngkeurb Village
Chin Sok Kong, Farmer, Chea Lear Village
Nhem Doeurn, Farmer, Chea Lear Village
Mol Visal, Farmer, Sorngkeurb Village
Shin, Farmer, Chea Lear Village
Dam Sithan, Farmer, Sornkeurb Village
Shon Kimhong, Farmer, Sornkeurb Village
Choub Soy, Farmer, Sorngkeurb Village
Tak Channy, Farmer, Sambo Village
Son Channy, Farmer, Sambo Village
Ho Channa, Farmer, Sambo Village
Mos Chin, Farmer, Sambo Village
Sronn Mei, Farmer, Sambo Village

(4) Members of Farmer Water User Community(FWUC)

Ouk Vor, President, FWUC
Sorn Serey, Irrigation Agriculture Department, FWUC
Leng Lon, FWUC Member, Sambo Commune
Chor Chim, FWUC Member, Sambo Commune
Binn Sophal, FWUC Member, Sambo Commune
Sompov, FWUC Member, Sambo Commune
Yem Yorn, FWUC Member, Sambo Commune
Chin Hearb, FWUC Member, Sambo Commune
Vann Vorn, FWUC Member, Sambo Commune
Som Ream, FWUC Member, Sorngkeurb Village
Phay Phoeurng, FWUC Member, Sorngkeurb Village
Chub Cheurn, FWUC Member, Sambo Commune
Inn Toeum, FWUC Member, Sorngkeurb Village

3. Summary of Field Research and Survey

Ⅰ. Plan of Field Research and Survey

1. Outline

	Description
Period	• September 1 to 7, 2013
Venue	• Phnom Penh and Cam Pong Cham Province, Cambodia
Purpose & Main Activities	• Field research for survey on recipient stake-holders and beneficiaries • Interview, questionnaire survey, on-site survey regarding ex-post evaluation • Document survey for data and information gathering • Convening a workshop for presentation and discussion on preliminary findings and evaluation results of the field research, etc
Composition of Field Mission	• Korean Experts - LEE, Kyong Koo/Mr., Team Leader, Vice President, Korea Global Development Consulting Center(KGDC) - Dr. CHOI, Dong Jin/Mr., President, Korea Research Institute for Environment and Development(KRIED) - Lee, Man Ho/Mr., Senior Managing Director, Dongil Engineering Company - WON, Jieun/Ms., Researcher, KGDC • Official of MOWRAM - Seok Hieng/Mr., Irrigation Agriculture Department • Local Consultants - Sokvibol Theam/Mr., Senior Consultant - Lak Chansok/Mr., Assistant Consultant • Observer - YI, Jiyoung/Ms., Evaluation Specialist, Evaluation Office, Korea International Cooperation Agency(KOICA)

2. Activity Schedule

Date	Description	Remark
Sept. 1 Sunday	• 18:40-22:05 From Incheon to Phnom Penh	KE689
Sept. 2 Monday	• 07:00-08:00 Meeting with Local Consultants - Theam Sokvibol, Senior Consultant - Lak Chansok, Junior Consultant/Researcher [Visit to the Ministry of Water Resources and Meteorology] • 10:30-12:00 Interview with Mr. Veng Sakhon, Deputy Minister of MORAM * Chhun Kheang, Diector, International Relations Department, MOWRAM • 11:10-12:00 Interview with policy practitioners - Planning and International Cooperation Department - Water Resources Management Department - Irrigation and Drainage Department - Water Supply and Sanitation Department - Engineering Department, etc • 14:00-16:00 Interview with professional experts - Cambodian Project Manager(H. E. Ponh Sachak) - Project Coordinator(Mr. Pak Bunna) - Construction Supervisor(Mr. Soek Hieng) - Irrigation System Expert(Mr. Hun Sary) - Agricultural Development Expert(Mr. Seng Sereyvitou) - Technical Expert(Mr. Theng Bunteng) [Visit to KOICA Cambodia Office] • 17:30-18:00 Meeting with Ms. Ryu Jihuun, Deputy Resident Representative & Interview with Ms. Baek Sook Hee, Resident Representative	Breakfast Phnom Penh Phnom Penh
Sept. 3 Tuesday	[Meeting with private stakeholders] • 09:00-11:00 Interview with Civil Engineers & Construction Managers - Mr. Sok Sothyra, Managing Director, PISNOKA International Corporation [Visit to the Related Authorities and Organizations] • 14:30-16:00 Meeting with official in charge at Cambodia National Mekong Committee - H.E. So Sophort, Deputy Secretary General - HRD Director [Meeting with Korean stakeholders] • 17:00-18:00 Korean Experts - Mr. Kim Kyu Tae, Project Manager, PMC Company - Mr. Cho Young Taek, Managing Director, Yooshin Engineering Corporation	Phnom Penh Phnom Penh Phnom Penh

Sept. 4, Wednes-day	• 08:00-10:00 Move to Batheay project site • 10:00-11:00 Project site trip • 11:00-12:00 Move to Kampong Cham City • 14:00-15:30 Interview with officials in charge, MOWRAM Regional Office in Kampong Cham Province - Mr. Oum Vibol, Director, Regional Office, MOWRAM - Mr. Yea Voeun, Deputy Director, Regional Office - Mr. Hum Sary, Chief of Irrigation Department	By car Batheay Kampong Cham
Sept. 5 Thursday	• 09:00-10:00 Move to Batheay District • 10:00-11:00 Interviews with local residents • 11:00-12:00 On-site survey to the Project site - Sam Bo and Chea Lear Commune Area • 12:00-12:40 Interview with local residents in Ta Buoy Village - Mr. Cham Chi Eun and other two farmers - Ms. Chung Sok Chan, female resident • 13:30-15:00 Meeting and interview with local stakeholders - Mr. Kon Nga, Chief, Chea Lear Commune - Mr. Nga Chhay Leng, Chief, Sambo Commune - Mr. Ouk Vor, Chairman, Farmers Water User Community(FWUC) - Other local residents and farmers • 15:00-16:00 Interview with District Governor - Mr. Lo Chanly • 15:30-16:30 Questionnaire Survey - Local farmers and residents(20 respondents) - Fellows of FWUC Training Program(10 respondents) • 16:30-19:00 Move to Phnom Penh	By car Village Batheay area Village Batheay District Office Batheay District Office Sambo Commune Office
Sept. 6 Friday	• 09:00-12:00 Preliminary Wrap-up of Field Research Activities • 14:00-17:00 Convening Workshop: Presentation and discussion on preliminary findings and evaluation results of the field research - Session 1: Presentation(14:00-16:00) - Session 2: Q & A, Grand Discussion (16:00-17:00) • 17:00-18:00 Wrap-up of overall activities in Cambodia and debriefing to KOICA Cambodia Office	Phnom Penh Phnom Penh Phnom Penh
Sept. 7 Saturday	• 23:20-06:35(+1 Day) Phnom Penh to Incheon	KE 690

Ⅱ. Description of the Field Research & Survey

1. Meetings in Phnom Penh

(A) Meeting conducted on 2nd September 2013 with

- H.E. Veng Sakhon, Deputy Minister of Ministry of Water Resources and Meteorology
- Mr. Chhun Kheang, Director, International Relations Department

H.E Veng Sakhon addressed the overview on Cambodia's development plans and the challenges. In 2011, the Royal Government of Cambodia (RGC) conducted a comprehensive review on the previous development plans to enhance future's development projects.

Moreover, the Royal Government of Cambodia passed a royal code dated June 23, 1999 promulgating the Law on Establishment of Ministry of Water Resources and Meteorology (MoWRAM); sub-decree No. 58 dated June 30, 1999, on the Organization and Functioning of Ministry of Water Resources and Meteorology; and royal code dated June 29, 2007 promulgating the Law on Management of Water Resources in the Kingdom of Cambodia.

In accordance with the above mentioned royal decree, there is a reform particularly in capacity building of MoWRAM because there has been the limitation of ITC to MoWRAM and O&M. As a consequence, trainings are provided for the MoRWAM staff. Knowledge and skill sharing are further improved, and budgets are also provided for O&M of the existing projects.

Over recent years, Cambodia has had many development partners such ADB, JICA, and particularly People's Republic of China which is Cambodia's biggest partner investing in more than hundred- million-US dollar projects. The Royal Government of Cambodia has also sought more financial supports from other external donors including KOICA.

In the line with the O&M of MoWRAM, the Farmer Water User Community (FWUC) was finally created to operate and maintain the flood control and irrigation system to supply water to farmers in both upper and lower areas or outside and inside the reservoir. H.E. added that the ISF has not been charged

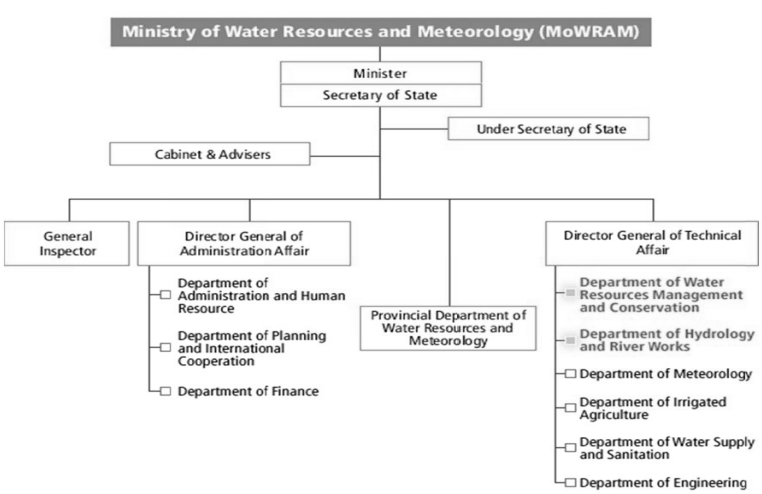
yet, but in the future, the charge of the ISF depends on the scale of the scheme.

In addition, from Cambodia's side, H.E. Veng Sakhon recommended that the project planning would be successfully accomplished if more financial supports are provided and more detailed information are shared with the Royal Government of Cambodia.

(B) Meeting on 2nd September 2013 with

- H.E. Ponh Sachak, Director-General of Ministry of Water Resources and Meteorology
- Mr. Sorn Serey, Irrigation Agriculture Department of FWUC
- Mr. Seng Sereyvitou
- Mr. Theng Bunteng, Engineering Department
- Mr. Bak Bunna, Sanitation Department
- Mr. Sek Hieng, Irrigation Agriculture Department

At the beginning of the meeting at Ministry of Water Resources and Meteorology (MoWRAM) held on 2nd September 2013 from 2:00 to 4:00pm, H.E. Ponh Sachak, Director-General of MoWRAM, introduced members who used to participate in the Batheay Flood Control and Irrigation System projects and mentioned the structure of the MoWRAM, shown as follow:



Source: Policies: State of Water Environment and Water-related Issue Policies

He added that the MoWRAM is given the following missions by the Royal Government of Cambodia:

(1) defining and developing the policies and strategies towards the utilisation, development and sustainable conservation of water resources at national and international levels in line with the royal government policy;

(2) studying and researching potential water resources in terms of surface, underground and atmosphere in order to establish the basic scientific techniques;

(3) developing the short, medium and long term plans for exploration, development and conservation of water resources and atmosphere in order to conserve the national economy and living standard of Cambodia;

(4) managing all direct and indirect utilization of water resources and minimizing the disasters;

(5) developing legislations related to water resources management, and their application; and

(6) providing necessary technical support and advice to private sectors, organizations, communities, and all people who are related to the improvement and exploitation of water resources.

H.E. Ponh Sachak overviewed the background of Mekong River. He said that the Mekong River runs from the mountains of Tibet to the delta in Vietnam. Four Rivers Cambodia's greatest rivers, the Mekong and the Tonle Sap cross directly in front of Phnom Penh's Royal Palace, named as "Four Rivers Palace, giving birth to the smaller Bassac River. The meeting of these rivers also results in a meeting of silts, fish and ethnicities as Khmer, Vietnamese and Cham communities live and fish the area. Tonle Sap River for most of the year, the Tonle Sap drains the great lake into the Mekong, but in flood season when the Mekong swells, the Tonle Sap actually changes direction, filling the great lake.

H.E. Ponh Sachak also addressed the background of the Batheay irrigation system. This dam was first constructed during Khmer Rouge regime between 1976 and 1979. This dam was manmade. During that time, people were

forced to construct the dam, and as a result many died of overwork, disease, and starvation. Moreover, during the civil war, the dam was not properly maintained and eroded from time to time. There are some problems occurred. First, in lower areas, villagers, their animals, and real estate could not be prevented from the flood. Second, water was inadequately supplied to their cultivated land in the upper and lower lands. Thus, the lands remained empty without any cropping.

Consequently, the Royal Government of Cambodia requested many development partners including the Korea International Cooperation Agency (KOICA) to help assist in construction of flood control and irrigation system in those areas.There are two phases of the projects. The first phase of the dam was started in 2007, named as the Batheay Flood Control Project consisting of a dam 13.6 km in length, nine places of irrigators with gate installation, nine lines of irrigation canals 4.5 km in length. total cost USD $2,452,015. Government of Republic of Korea spent USD $1,790,600 on infrastructure and construction, while the Royal Government of Cambodia spent USD $661,415 on the affected land compensation. This flood control and irrigation system benefited nine villages inside the area and twenty villages outside the area. Another phase consists of nine lines of main canals 18.1 m in length, two places of head regulators with gate installation, twelve outlet structures, and compensation to affected people. The total cost of project is USD $2,686,740 among which USD $2,303,000 on the infrastructure and construction was funded by Government of Republic of Korea.

After the construction of the flood control and irrigation system, there are 25000 hectares of land used for cropping. The villagers in both areas are able to do cropping twice per year and thus double their cropping productivity since the water is sufficiently supplied. Around 30,000 farmers have benefited from the projects.

However, there are some limitations to the MoWRAM to effectively carry out O&M. First, the budget provided by the Royal Government of Cambodia is limited. Second, high techniques are required.

Furthermore, H.E. Ponh Sachak also listed three scales of flood control such as "big flood" happening two times in 2000 and 201, "middle flood", and "small flood". He also added there were three scales of irrigation system. The "big scale" refers to more than 5000 hectares for which 2/3 of budget would be paid by the Royal Government of Cambodia. The "medium scale" is between 200 and 5000 hectares. In this scale, the O&M is ensured by the Royal Government of Cambodia. Lastly, the "small scale" that is below 200 hectares is operated and maintained by the respective community. He confirmed that the Batheay Flood Control and Irrigation System is categorized as the big scale.

In addition, due to high flood and climate change damaging the dikes, the FWUC requested to get more financial supports and a concrete strategic plan to control more than 2000 irrigation system. However, more than 300 irrigation systems have currently been constructed. The quantity of the irrigation system is required, and the quality of the systems can be enhanced later. To succeed in this plan, the Royal Government of Cambodia needs a big amount of funds for construction and O&M.

H.E. Ponh Sachak also said that the strategic plan of MoWRAM has not perfectly been succeeded yet, but at least a number of positive outcomes can be seen, among which trainings are provided for farmer to use better seeds (to grow cassava, sweet potato, water melon, and cucumber depending on the interests of farmers besides rice), to properly cultivate their cropping, and to be aware of some techniques (nonuse of chemical pesticide, waste, etc.).

H.E. Ponh Sachak also confirmed that the project was almost controlled by the KOICA, not the respective Ministry, MoWRAM, which just assisted in the project planning and implementation. He refused that Cambodia had no good constructors.

Mr. Sorn Serey, Deputy Director of Irrigation Agriculture Department of FWUC, said that the FWUC had not been supported by the KOICA yet since

there has been no any positive response from KOICA for the financial and technical O&M assistance.

He also added that there were two main beneficiaries: local farmers inside and outside the reservoir areas and FWUC members. In 2010, 53 FWUC members were trained how to properly operate and maintain the flood control and irrigation system and he expected that the ISF would be paid by the benefited farmers in order to buy soils to fulfill holes and to sustain O&M.

H.E. Ponh Sachak added that other projects were also implemented in Takeo province by the Royal Government of Cambodia and in other areas by ADB.

(C) Meeting on 3rd September 2013 with

- Mr. Sok Sothyra, Managing Director, PISNOKA International Corporation (P.I.C.)

Mr. Sok Sothyra introduced the background of PISNOKA international corp. (P.I.C), which is one of the leading construction companies in Cambodia. P.I.C has long built notable achievements since 1993 in the business with many skilled workers and a large collection of construction equipment owned by the company itself. The P.I.C is not merely known by local residents but also foreigners because of its strong business reputation and its high standards for Cambodian with strong focuses on safety and sanitation.

The P.I.C mostly works as the sub-constructor of JICA and receives a few projects annually. Since its inception in 1993, the P.I.C just provided only labor supply but now transforms itself into a well- known private construction company which has so far received a total of 77 projects. The cost of each project is not more than one millions US dollars.

According to Mr. Sothyra, there is no a fixed construction standard for Cambodia. P.I.C is flexible and carried out many major projects including American and Austrian Embassy in Cambodia. He said that Japanese standard

is stricter than that of Korea in terms of safety, but both Japan and Korea have almost similar construction quality.

Regarding the Batheay project, P.I.C. also took part in the construction and provided two-year guarantee over the projects. As a consequence, only 1% or 2% of damaged construction needed to be repaired. Mr. Sothyra also said that the success criteria of the P.I.C. are its own quality equipment, engineering skill, and very qualified engineers.

Mr. Sathyra noted that the problem working with the Royal Government of Cambodia is that no payment is given to the P.I.C. He also said that in Cambodia, it has become common that many construction companies hind the profit report to the Royal Government of Cambodia in order to avoid heavy taxes due to the hierarchy and complex administrative process.

(D) Meeting on 3rd September 2013 with

- H.E. So Sophort, Deputy Secretary General, Cambodia National Mekong Committee (CNCM)
- Two officials

On 3rd September 2013 at Mekong River Commission, Korean and Cambodia teams met H.E. So Sophort. His Excellency first addressed the background of Mekong River. The Mekong River is one of the world's great river systems, flowing 4,909 km through six countries: China, Myanmar, Thailand, Lao PDR, Cambodia, and Viet Nam. The source of the river's great productivity is its seasonal variation in water level and the range of wetland habitats inundated. The Mekong River Basin's biodiversity is immense, even in comparison with other parts of tropical Asia. Its biodiversity is fundamental to the viability of natural resource-based rural livelihoods of a population of 60 million people living in the Lower Mekong Basin. 86% of Cambodia is located in Mekong.

In addition, His Excellency also overviewed the Mekong River Commission (MRC). His Excellency said that the Commission is the only inter-governmental agency that works directly with the governments of Cambodia, Lao PDR, Thailand and Viet Nam on their common specific interests - joint management

of shared water resources and sustainable development of the Mekong River. As a regional facilitating and advisory body governed by water and environment ministers of the four countries, the MRC aims to ensure that the Mekong water is developed in the most efficient manner that mutually benefits all Member Countries and minimizes harmful effects on people and the environment in the Lower Mekong Basin. Serving its member states with technical know-how and basin-wide perspectives, the MRC plays a key role in regional decision-making and the execution of policies in a way that promotes sustainable development and poverty alleviation. The MRC engages a wide range of stakeholders into its programme work and strategic planning.

His Excellency clarified that the Mekong River Commission did not get involved much in the Batheay Flood Control and Irrigation System and thus he could not precisely answer some specific questions. He suggested the CDRI and CEDAC be met since these two nongovernmental institutions are specializing in carrying out the agriculture research and implementation.

(E) Other two meetings were held by only Korean team with KOICA Country Office at Phnom Penh Tower on 2nd September 2013 and Yooshin Engineering Cooperation Corporation on 4th September 2013.

2. Meetings in Kampong Cham Province

(A) Meeting on 4th September 2013 with

- Mr. Oum Vibol, Director of Department of Water Resources and Meteorology
- Mr. Hun Sary, Chief of Irrigation Office
- Mr. Yea Voeun, Deputy Director of Department of Water Resources and Meteorology

The more than two-hour meeting was held on 4th September 2013 at Department of Water Resources and Meteorology in Batheay district, Kompong Cham province. The meeting was attended by three government officials and the ex-post evaluation Korean and Cambodian team.

Mr. Oum Vibol briefly addressed the background and areas located in two communes Sambo and Chea Lear where the Batheay projects were implemented. In the lower lands, there are approximately 2220 hectares of lands able to be cultivated and protected from the flood after the completion of the projects. Ten villages and schools are also protected from the Mekong flood. And the lands outside the reservoir (3500 - 8000 hectares) have also benefited from the projects because people have enough water for their cropping. As a result, 5650 families equal to 30,500 villagers in 20 villages in Sambo and Chea Lear commune, Batheay district, have gotten benefits from the Batheay projects.

As a consequence, the villagers can increase their yield production from 2.5or 3 tons per hectare to 4 tons per hectare of land after the completion of the projects. Moreover, the hospitals and schools have been protected from the flood and increasingly accessed because of convenient access of the roads.

According to Mr. Vibol, there is a concern regarding the information sharing from the central government to local authorities since the information about big project worth more than millions US dollars is not publicized or disseminated to the local authorities. Another problem is that big protects require more technical engineers, which exceed the capacity of the local authorities.

Regarding the flood control and irrigation system in Batheay district, there have been some damages to the dikes which need to be repaired and maintained. Although the Royal Government of Cambodia provides 200 million riel approximately equal to USD $50,000 on the O&M, it is not enough. Therefore, more funds sources need to be diversified.

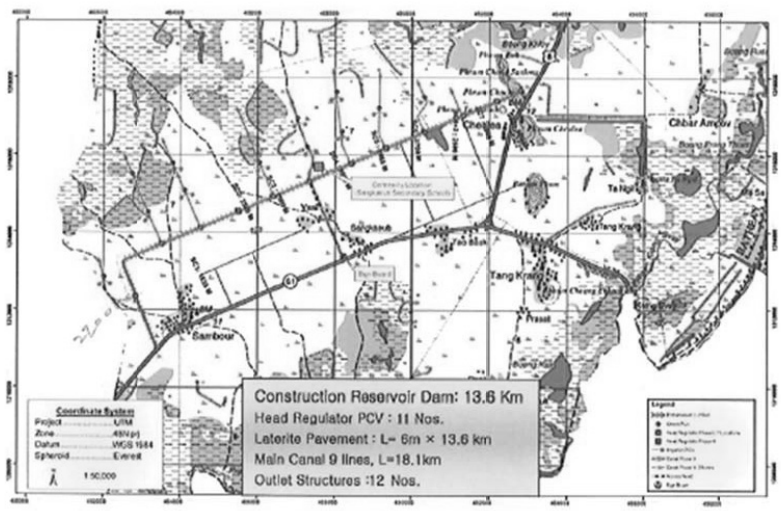


Photo of Batheay Projects: Lands Inside (Lower) and Outside the Reservoir (Upper)

(B) Meeting on 4th September 2013 with

- Mr. Korn Kan, Chief of Chea Lear Commune
- Mr. Nga Chhay Leang, Chief of Sambo Commune
- Mr. Ouk Vor, Leader of Farmer Water User Community (FWUC)
- And other FWUC members

This meeting was held at Batheay District Office on 4th September 2103, attended two commune chiefs, FWUC leader, and FWUC members. The background and outcomes of the Batheay projects were shared by Mr. Nga Chhay Leang. Before the projects, the lower areas were flooded and the entire lands were left empty. After the construction of the flood control and irrigation system, the people living in both outside and inside the reservoirs are "very happy" because their lands, houses, and schools can be protected from the seasonal floods. Furthermore, before they cultivated only once, but now they can do two or three-time cropping annually since they afford to use agricultural machinery. Consequently, their rice yield can be double or triple.

Mr. Korn Kan added more to the improvement of quality of villagers' living standards. Now approximately 80% of families afford to use electricity 24 hours per day. However, the electricity price is quite expensive (3,200 riel/k).

Equally important, the education access also keeps increasing thanks to the roads. The hospital access is also more convenient. For instance, pregnant women frequently go to have medical check and deliver babies more safely. Moreover, before women went to the rice field to bring their husband food because of difficulty in the road conditions, but now they can go to have lunch with their families at home.

Mr. Ouk Vor addressed the structure of the FWUC: Leader, sub-leaders, and members. There are 52 members in FWUC branches to operate and maintain the flood control and irrigation system. However, according to Mr. Ouk Vor, the main problem is that despite some budgets provided by the Royal Government of Cambodia, FWUC has no enough financial and technical capacity to fix the damages to dikes. Therefore, FWUC needs other donors including the Government of Republic of Korea fund to repair the dikes. Mr. Ouk Vor added that FWUC needed a meeting office that KOICA previously promised to build. He further requested KOICA to extend canals to three or four kilometter in order to get enough water.

Photo: Meeting between Ex-Post Evaluation Team and Two Commune Chiefs, FWUC Leader and Members at Batheay District Office

(C) Meeting on 5th September 2013 with

- Mr. Lor Chanly, Batheay District Governor

This meeting was attended by the Korean team (Mr. Lee Kyong Koo, Dr. Choi Dong Jin, and Mr. Lee Man Ho), Senior Local Consultant (Mr. Theam Sokvibol), and Batheay District Governor at Batheay District Office.

(D) Meeting on 5th September 2013 with

- Mr. Chim Cheurn, Tapay villager, Sambo commune
- Mr. Cheung Sok Chans, villager/farmer
- And other three villagers

According to Mr. Chim Cheurn, a villager in Tapay village of Sambo commune, addressed the significance of the Batheay projects. According to Mr. Cheurn, there are around 360 families in Tapay village. He said he has only a few hectares of cropping land, while five other hectares are rent to increase their rice production. The farmers in this village also shifted from using "heavy rice" to "light rice". The heavy rice takes 6 months, while light rice takes only a few months. Therefore, the villages are able to crop three times per year during both dry and raining season. The water in the village is not always enough for their cultivation, so sometimes people depend on the seasonal rainfall to watter their crops. The control over the water gate is also another controversy between the villagers living inside and outside the reservoir areas where the floods can cause at least minor damages.

Parking outside the houses, many new tractors are used to facilitate their farming. According to Mr. Cheurn, the cost of each tractor is USD $3,000. He bought his tractor three years ago and rents it to other villagers if needed. He also said that there are around 30 tractors in the Tapay village, and not all the villagers own tractors.

Due to the lack of techniques, the villagers quit raising pigs, and now they dig the pounds to raise fish. The size of the pond is 40 square meters. Regarding the land price, before, maybe in 2008, each hectare of land cost USD $2500. However, the current price of the land is USD $30,000 per hectare. That is the reason why most of the lands now along the dikes belong to the middleman or rich people.

Photo: Meeting with Ex-Post Evaluation Team with Villagers at Tapay Village

(E) Meeting on 5th September 2013 with 26 Sambo Commune Residents

A Korean researcher (Ms. Won Jieun), a Korean evaluation specialist (Ms. Yi Jiyoung) from the KOICA, and a Junior Local Consultant (Mr. Lak Chansok) delivered questionnaires to 26 villagers. Among those 26 questionnaires, only 21 were deemed quite valid. The invalidity of questionnaires and inactive participation of villagers in sharing their own opinions were caused by illiteracy and political constraint.

The field questionnaire surveys were supplemented by the 2nd field trip made in October in which Mr. Lee Man Ho and Mr. Lak Chansok took part. The summary of the questionnaire surveys is attached in a separate attachment of the Report.

3. Workshop in Phnom Penh

(A) Partcipants

- H.E. Ponh Sachak, Director-General of Ministry of Water Resources and Meteorology
- Mr. Sorn Serey, Irrigation Agriculture Department of FWUC
- Mr. Seng Sereyvitou
- Mr. Theng Bunteng, Engineering Department

- Mr. Bak Bunna, Sanitation Department
- Mr. Soek Hieng, Irrigation Agriculture Department
- Mr. Yoo Jee Hyun, Deputy Representative KOICA Cambodia Office
- Mr. Kim Sang Jun, Deputy Representative KOICA Cambodia Office
- Mr. Lee Kyong Koo, Team Leader, Vice President, Korea Global Development Consulting Center (KGDC)
- Dr. Choi Dong Jin, President, Korea Research Institute for Environment and Development (KRIED)
- Mr. Lee Man Ho, Senior Managing Director, Dongil Engineering Company
- Ms. Yi Jiyoung, Evaluation Specialist, Evaluation Office, KOICA
- Ms. WON, Jieun, Researcher, KGDC
- Mr. Nga Chhay Leang, Chief of Sambo Commune
- Mr. Ouk Vor, Chairman of Farmer Water User Community (FWUC)
- Mr. Kout Chheurn, Assistant to Chea Lear Chief
- Mr. Sorn Theoun, Deputy-Director of FWUC
- Mr. Theam Sokvibol, Senior Local Consultant
- Mr. Lak Chansok, Junior Local Consultant
- Mr. Keo Socheat, Researcher, CDRI
- Mr. Ly Sok Heng, Lecturer, RUPP
- Mr. Khieu Sunlong, Lecturer, RUPP

(B) Workshop Program

Time	Contents
Registration and Inception	
14:00-14:10	Opening Remarks by H.E. Ponh Sachak and Mr. Yoo Jee Hyun
14:10-14:15	Orientation to the Workshop by H.E. Ponh Sachak
Session I: Presentation	
14:15-15:00	Presentation by Korean Experts • Presentation on the performance of the Flood Control Project presented by Mr. Lee Kyong Koo • Presentation on the performance of the Irrigation System Construction Project presented by Dr. Choi Dong Jin • Presentation on summative evaluation results of the Projects presented by Mr. Lee Man Ho

Coffee Break (15:00 – 15:15)	
15:15-16:00	Presentation by the Cambodian experts • Presentation by Mr. Bak Bunna • Presentation by Mr. Theam Sokvibol • Presentation by Mr. Nga Chhay Leang
Session II: Q & A, Discussion	
16:00-16:30	Q & A and Discussion
16:30-16:40	Concluding by H.E. Ponh Sachak
Closing	

(C) Minutes of Discussion

(a) Mr. Lee Kyong Koo, Team Leader of the ex-post evaluation on the Flood Control and Irrigation System in Batheay District and Vice President of Korea Global Development Consulting Center (KGDC) presented the overview on the background of the two projects, scope of the ex-post evaluation, evaluation team, evaluation criteria and methodology, research field, and preliminary results of the research field.

The Batheay Flood Control Project from 2007 to 2008 totally cost US$ 2 Million, and the Batheay Irrigation Construction Project from 2009 to 2010 spent US$ 2.5 Million. Three years after the completion of the projects, these two projects are subject to the ex-post evaluation in accordance with the Development Cooperation Evaluation Guideline (November 2008, KOICA). The purpose of ex- post evaluation is (1) to improve future projects through feedback of lessons learned in the process of the project planning and implementation and (2) to provide a basis for accountability, including the provision of information to the public. Through the evaluation of failures as well as successes, valuable information is generated which, if properly fed back, can improve future cooperation programs and projects.

This ex-post evaluation is a comprehensive review on the overall results of the projects including impacts, effects, and sustainability as well as the appropriateness of the process. An end-of-the-project evaluation was made in

2011, confirming the rationale and achievement of the projects' development objectives. The scope of the ex-post evaluation research will encompass (1) the process and outcome of the projects in terms of relevance, effectiveness, efficiency, impact, sustainability and the cross- cutting issues - gender main-streaming and environment, (2) focusing on effects and impacts, not only direct but also indirect social, economic, institutional, environmental and other development indicators resulting from the activities. As this research study is an ex-post evaluation, the focus of the study will be highlighted on the outcomes of the projects - short, mid and long term effect and impact - as well as sustainability.

KOICA entrusted the research study to Korea Global Development Consulting Center (KGDC), an independent research institute. This evaluation task will be undertaken by a team of experts arranged by KGDC for five months from July to November 2013. The study team consists of three (3) Korean experts, one (1) Korean research assistant and two (2) local consultants of Cambodia. A Cambodian official in charge of monitoring the projects joined the activities of field research survey in Cambodia for a joint evaluation. Korean team is consisted of one Team Leader (T/L), two experts in water resources management and agricultural irrigation respectively and one assistant research. The evaluation research follows an logical approach of analysis and the methodology of tri-angular surveying, including document and statistics analysis, interviews, questionnaire survey, field research on site, workshop, etc.

The field research took from September 1 to 7, 2013 (6 nights 7 days) in Phnom Penh and Kompong Cham Province, Cambodia. The main activities carried out during the field research are (1) field research for survey on recipient stake-holders and beneficiaries; (2) Interview, questionnaire survey, on-site survey regarding ex-post evaluation ; (3) Document survey for data and information gathering ; and (4) Convening a workshop for presentation and discussion on preliminary findings and evaluation results of the field research, etc.

Literature research; Data and statistics analysis; Interview with policy practitioners and field workers; Interview with local residents and beneficiaries; Questionnaire survey on targeting group of stakeholders; On-site field trip and survey; workshop in Phnom Penh, etc. Moreover, there are five criteria of the ex-post evaluation: Relevance, efficiency, effectiveness, impact and sustainability.

According to Mr. Lee's preliminary Findings of the field research, the cooperation with the Royal Government of Cambodia has been relevant to the overall development goal of the Cambodian government - "poverty reduction and economic growth through enhancement of agriculture sector development, and the Rectangular Strategy of the Royal Government of Cambodia establishing the four pillars of strategic growth, National Strategic Development Plan 2009-2013.

In the short and medium term, the effects of the projects are evident in various realms concerning the project such as rural infrastructure development in the region, enhancement of agricultural productivity and management system, increase in rural income and improvement of rural living standard, increased rural employment and provision of off-farm opportunities, and positive contribution to cattle raising, inland aquaculture, etc.

The Impacts on poverty reduction and cross-cutting issues are positivity on alleviating rural poverty in a the region and women in development (WID), and friendliness to the environment and conducive to better vegetation and environmental protection. Moreover, the impacts on social development are positive on promoting education and improving primary health. Other unexpected impacts and influence are high rise of land price within the project site due to enhancement of agricultural infrastructure, better supply of irrigated water, flood control, better road access, etc. and conflicts of interests among the villagers between farmers of lower land owner and upper land owner.

Sustainability of policy and institutional support are fair because they are

consistent government's policy with added emphasis on water resources management and rural development and political intervention (related to the collection of Irrigation Service Fee, etc.). Regarding the financial sustainability, the financial availability for irrigation facilities and system management and maintenance is very pessimistic because the self-sustainability of FWUC by collecting ISP is unfeasible and lacks of operation and maintenance.

As recommended, the next phase of the projects needs some immediate supplementary maintenance investment and rehabilitation of the system of FWUC, a substantial new additional investment for a fundamental solution for flood control, water supply and irrigation in the medium term perspective.

Photo: Workshop on Preliminary Results of the Field Research, Phonom Penh Hotel, Cambodia

(b) Dr. Choi Dong Jin presented the background of the ex-post evaluation and formation of a model program for IWRM and rural development to secure long-term sustainability in order to manage many cooperation projects with ODA and find needs for sustainability of Batheay project. The best practice model of Korea-Cambodia Cooperation Program Infrastructure, Knowledge Sharing, and Capacity Building should be properly made and applied to other future's projects.

Moreover, Dr. Choi overviewed the characteristics of Batheay project and project outputs. In Phase I and II, the beneficiaries are 20 villages equal to 5,650 households (30,000 villagers). The paddy area increases from 1,800 hectares to 65,000 hectares, and crop production significantly increases from 2.7 tons per hectare (4,860 tons per year) to 4.5 tons per hectare (29,250 tons per year). In addition, the farmers in the respective areas cultivate twice or triple per year since there is enough water supply. It is noted that the maximum water storage capacity is 50 million metric meters.

Furthermore, Dr. Choi addressed the evaluation after the construction conducted by KOICA and MoWRAM and the ex-post evaluation focus on five main criteria: relevance, efficiency, effectiveness, impact, and sustainability. There are some suggestions. First, there should be a proper water-use planning with good information. The water is demanded for dry season irrigation and multi-cropping, and the existing water supply capacity depends on the seasonal rainfall. Therefore, villagers still face water deficit. As suggested, first, the size of reservoir should be further extended. Second, the amount of budgets to invest should be enhanced. Third, water use rule to avoid conflict should be promoted and encouraged. Moreover, as suggested, there should wise use of floodplain. Regarding the FWUC, it should have been started in the beginning stage of the project, and training program should have been focused more on capacity building and irrigation system. As found out, the responsibility without appropriate power or managerial roles including water allocation is not sustainable. Moreover, the ISF is not for financing but for motivation.

There are four recommendations to make the FWUC sustainable. First, the responsibility with adequate payoff means that the duty to pay ISF will be equipped with benefits. Second, the FWUC should have self-supporting business such as managing form tractors, micro-financing, crop distribution center, rice polishing mills, etc. Third, the cooperation with central government, stakeholders, and other beneficiaries should be strengthened, and the FWUC members should be extended. Last but not least, the initial

support from external partners in terms of knowledge sharing, technology transfer, and financial supports should be promoted and sought.

(c) Mr. Lee Man Ho presented a brief overview of Batheay Flood Control and Irrigation System. He also addressed the project location and main facilities. The projects were carried out in Batheay district, Kompong Cham province, consisting of 13.6 km reservoir dike, 18.1 km main canal, 12 EA lateral culverts, and 2EA drainage culverts. 800m of roads have been currently accessed. Moreover, Mr. Lee presented that 20 villages (5,650 households) approximately equal to 30,000 villagers have benefited from the projects. First, water can be reserved in the flood season and water is sufficiently supplied in the dry season. Second, the projects also prevent villagers and real estate from damaging. Fourth, villagers' living quality has been upgraded since the agricultural production has been increased after the completion of the projects.

Moreover, Mr. Lee shared some considerations over the operation and maintenance which is now almost stopped because ISF is not properly collected from the farmers who use the water to repair facilities. During the rainy season, the houses, farm lands, and schools located in the lower areas are damaged.

As recommended, this project requires all means to covey water to fields as many different volume or size of channels, drainage canal and pumping station. Second, after the implementation of construction work of secondary canal, farm land consolidation work including tertiary canals should be followed.

Photo: Mr. Lee Man Ho Presented His Findings of Field Research During the Workshop

(d) Mr. Bak Bunna narrated the background of the Batheay Flood Control and Irrigation System project. The system is located in two communes Sambo and Chea Lear, Batheay district Kampong Cham province, which is 50 km north of Phnom Penh. The dam was built in Khmer Rouge regime.

Due to not enough funds for operation and maintenance, nearly all of the dam and main canals were eroded and broken.

Every year Tonle Sap Flood caused to damage rice and other crops of the farmers around 2500 hectares on wet season and shortage water for rice, animals and other crops on dry season. Therefore, the Batheay project was carried out in two phases (I and II).

The project consists of a dam 13.6 km in length, 11 areas of head regulators with water gate, 9 lines of main canals 18.1 km in length, 12 outlet structures and compensation to affected lands. Phase I was finished on 20 January 2009, while Phase II on 03 March 2011.

To operate and maintain the Batheay flood control and irrigation system, Farmer Water User Community (FWUC) was established as the following steps:

Step 1: Hold initial meeting at system or subsystem levels.

Step 2: Identify irrigation service area and potential members of FWUC and conduct PRA.

Step 3 & 4: Farmers agree to form FWUC and plan organizing activities.

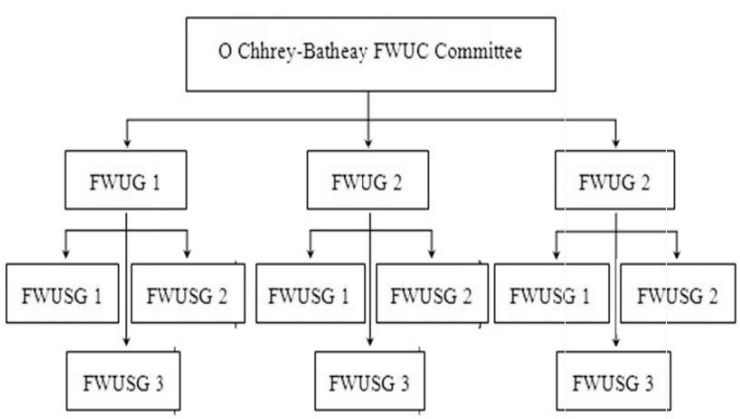
Step 5: Farmers prepare and adopt FWUC statute and by-law

Step 6, 7 & 8: Farmers establish FWUC and select leaders and conduct five years works plan.

Step 9: Training to FWUC committee and local authorities.

Step 10: Raising awareness of FWUC Policies to farmers

As a result, O Chrey-Batheay FWUC was finally established in February 11th, 2010 elected based on free and fair election from farmers in the command area. The following is the structure of the O Chrey-Batheay FWUC.



After the construction of the Batheay flood control and irrigation system, the beneficiaries are 9 villages and some schools were protected from Mekong flood. The wet season rice 2220 hectares were protected from the flood and able to cultivation 2 times per year. And the dry season rice outside of reservoir around 3500-8000 hectares is sufficiently watered owing to enough water from the irrigation. Around 5650 families equal to 30,500 people in 20 villages in Batheay district, Kampong Cham province, have also got benefits from the projects.

Photo: Mr. Bak Bunna delivered His Presentation During the Workshop

(e) Mr. Theam Sokvibol, Senior Local Consultant, presented five criteria of evaluation on the preliminary findings of the field research: Relevance, efficiency, effectiveness, impact, and sustainability of the two projects, followed by some recommendations for the Royal Government of Cambodia, funding agencies, local authority, and local residents.

Regarding the relevance, the two projects are consistent with Rectangular Strategy of the Royal Government of Cambodia since the projects have improved agricultural productivity and diversification. Moreover, the projects are relevant to the agriculture Sector Strategic Development Plan by increasing in market access, productivity, and irrigation and improvement of technique. Additionally, the Millennium Development Goals (MDG) have partially been met such as poverty reduction, education access, health service access, decrease in child mortality rate, improved maternal health, promotion of global partnership, and good environment consideration.

Regarding the efficiency of the projects, the KOICA and the Royal Government of Cambodia chose qualified construction company, have good

communications with beneficiary stakeholders, and established the Farmer Water User Community (FWUC) as well as have trained its members on the operation and maintenance.

For the effectiveness, the projects were very successfully completed. Moreover, it is very effective in control of the flood and irrigating farmland over two communes, Sambo and Chea Lear, in the functions of the dike during flood season, and in management of facilities and the FWUC. As a consequence, productivity, income, employment, agricultural techniques and livelihood have become better, compared to those before the construction of the projects.

Regarding the impacts of the projects, there are many positive impacts such as improving farmers' practices, increasing in the value of their land, having new management and problem-solving experience for local authority, strengthening relationship between the two countries and peoples, and improving social wellbeing.

Sustainability of the projects is fair because there is a little support from the central government and financial availability for the operation and maintenance. However, te FWUC's roles have been limited to collect Irrigation Service Fee (ISF) from the beneficiary, particularly farmers. There is still lack of sense of ownership within the community, leading to tragedy of the commons.

According to Mr. Sokvibol, there are some policy recommendations in order to the future's projects and the cooperation between Republic of Korea and the Kingdom of Cambodia better. For the Royal Government of Cambodia, first, effective communication should be ensured between the central governments, stakeholders, and beneficiaries. Second, information and reports among all relevant stakeholders should be publicized. Third, local authority by allocating necessary annual budget to carry out operation and maintenance should be empowered. Last but not least, good relationship with funding agencies and identifying areas of partnership should be continued. For the

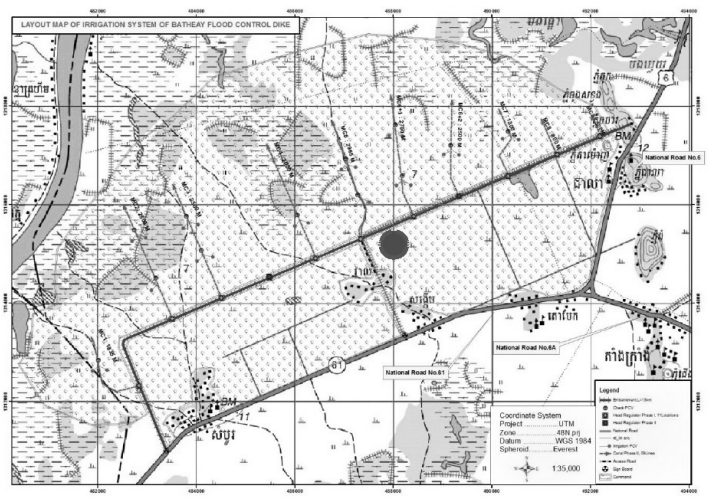
funding agencies, thorough feasibility study and design should be conducted. Moreover, durability and sustainability of the project should be ensured. For local authorities, the needs of the local residents and the problems they face should be carefully studied and identified, and the immediate problem solving should be carried out and encouraged. For the community and local residents, first, mutual understanding should be further promoted. Second, the ownership and leadership in the operation and maintenance should be taken. Last not least, cooperation with the community should be strengthened for the sake of the common interests.

(f) Mr. Nga Chhay Leang, Sambo Commune Chief, shared the exact ideas with Mr. Theam Sokvibol and requested the Government of Republic of Korea to further assist Cambodia in repairing and maintaining dikes and dams in two communes, Sambo and Chea Lear, Batheay district, Kompong Cham province.

(g) Discussion: The workshop was dominated by the debate over the canals dug to prevent the lower areas inside the reservoir from the flood and concluded by H.E. Ponh Sachak. Moderated by H.E Ponh Sachak, the 30-minute discussion among the government officials focused on the previous work and a new suggested location to dig another canal to prevent the seasonable floods in the area inside the reservoir.

Mr. Nga Chhay Leang, Chief of Sambo commune, praised the grant aid of the Government of Republic of Korea on the Batheay projects beneficial to villagers living inside and outside the reservoir and voiced a concern over the existing floods in the lower land inside the reservoir.

Mr. Bak Bunna, a former Batheay project coordinator, pointed the locations of the dikes and canals successfully built in accordance with the Batheay projects. And he further suggested that another canal should have been dug to protect the seasonable floods damaging the crop fields of the farmers living in the lower area inside the reservoir (See: the red circle on the map identifying the location of anther new canal that should be constructed).



Layout: The proposed location of new canal construction

Mr. Theng Bunteng from Ministry of Water Resources and Meteorology (MoWRAM) agreed with Mr. Bunna on the location and discussed how the canal construction should be carried out to prevent the floods from causing damages to the villagers.

After the discussion, H.E. Ponh Sachak summarized all the main points of the whole workshop. His Excellency thanked Korean ex-post evaluation team and especially Korean Government to provide Cambodia with development aids, and His Excellency hoped that Korean Government would further develop a good strategic partner with Cambodia.

Photo: Mr. Bak Bunna pointed the locations of the Batheay Projects

Ⅲ. Supplementary Field Research and Survey

1. Outline

Upon analyzing and making summery of the domestic research in Korea and the 1st field study in Cambodia, the Evaluation Team found that an additional field survey was needed for supplementing the previous questionnaire surveys and the confirmation of the project impact and effects requiring persuasive verifications. Some questionnaire answers could not be deciphered because of lacking respondent data and incompleteness of the answers given.

The supplementary field research and survey was conducted by Mr. Lee Man Ho, expert in agricultural engineering and irrigation, and Mr. Lak Chansok, local assistant consultant, from October 21 to November 1, 2013. based on the initial analysis on the results of field research and questionnaire survey the study team made additional questionnaire surveys and gathered complementary figures and opinions on some performance

data and impact indicators of the project through field trips to the Batheay region. Especially, two representative groups of local residents of Sambo Village in Sambo Commune and Chea Lear Village in Chea Lear Commune were chosen as the samples for surveys focusing on main indicators as follow:

- Usage of agricultural machineries
- The amount and percentage of cultivated land using agricultural machineries
- Multi-crop production
- Average land price
- Cultural accessibility, etc

2. Results of the Supplementary Research and Survey

A) Survey in Sambo Village

(a) Sambo Village Representative Group of Local Residents

In Sambo Village, there are 5,187 people equal to 1,117 families. There were only 24 local residents participating in this additional field interview. Their names and positions are listed as follow:

No.	Full name	Position
1	Chop Hong	Farmer
2	Houl Him	2nd Sewer System Leader
3	Jen Heam	2nd Sewer System Deputy-Leader
4	Len Lon	3rd Sewer System Deputy-Leader
5	Pin Lang	Farmer
6	Lan Ly	Farmer
7	Tam Ta	Farmer
8	Ork Ros	Farmer
9	Ngil Moeung	Farmer
10	Pham Soreang	Farmer
11	Heang Heat	Farmer
12	Too Varim	1st Sewer System Deputy-Leader
13	Le Leang	Farmer
14	Lon Men	Farmer
15	Jon Chin	Farmer
16	Ouk Vor	President of FWUC
17	Jorn Khean	Farmer
18	Ten Kheang	Farmer

19	Too Khoeurn	Farmer
20	Ngim Chamroeun	Sambo Village Chief
21	Sourn Sor	Farmer
22	Sorn Theourn	3rd Sewer System Leader
23	Chon Khon	Farmer
24	Som Yorn	Farmer

B) Results of the Survey

① Usage of Agricultural Machineries

According to Sambo Village representative group of local residents, the main machineries used for agricultural purposes are combine (big tractor), walking tractor (small tractor), water pumping machine, and pesticide fumigating machine. Yet, they have not had any combine.

Year	Number			
	Combine	Walking Tractor	Water-pumping machine	Pesticide fumigating machine
Before	0	0	0	0
2007	0	10	60	0
2008	0	20	100	10
2009	0	50	130	20
2010	0	80	150	80
2011	0	100	180	80
2012	0	110	Between 190 & 200	80
2013	0	130	200	110

② Amount of Cultivated Land Using Agricultural Machineries

The representative group of local residents agreed on the change in the amount of cultivated land inside the reservoir where Sambo Village is located. Before 2007, only 150 hectares of the land were cultivated due to the insufficiency of water. However, since 2007 after the construction of the Batheay projects, the entire 500 hectares of land are used for cultivation because of enough water.

③ Multiple-Crop Production

In Sambo Vllage, farmers grow only rice because of the soil condition unsuitable for other types of cropping. Depending on the amount of water, farmers in the village mostly cultivate rice only once per year. In some years

when water is sufficient, they can do rice cultivation twice in every six month.

④ Average Land Price

The land is categorized into three types: Front land (the land next/near national roads), middle land (the land between front and back land), and back land (the land far away from the national roads). However, the local residents are not sure how to measure the exact distance among those types of land. Before 2007, the price of lands was very low since no one wanted to buy them at all. After 2007 when the Batheay construction started, the land price increased significantly. From 2009 to 2013, the price of the middle and back land fell down sharply as the land demand decreased dramatically, while the front land price has stagnated.

Year	Types of Land	Price
Before	Front Land	USD 1,500$/ha
	Middle Land	USD 1,000$/ha
	Back Land	USD 1,000$/ha
2007-2008	Front Land	USD 40,000$/ha
	Middle Land	USD 10,000-20,000$/ha
	Back Land	USD 10,000$/ha
2009-2013	Front Land	USD 40,000$/ha
	Middle Land	USD 3,000-4,000$/ha
	Back Land	USD 3,000$/ha

⑤ Cultural Accessibility

There has been a huge change of cultural accessibility since 2007. The table below details the estimated number of television, motorcycle, and bicycle in 2003, 2008, and 2013.

Year	Number		
	Television	Motorcycle	Bicycle
2003	20 (Black and White)	100	200
2008	300	500	500
2013	800	500	500

Moreover, people find it more convenient to access to the clinic service owing to three main reasons. First, the clinic (e.g. Sambo Clinic) is located near the village. Second, the road condition is better. Last but not least, there are many better transports (e.g. motorcycle).

Before 2007, more women used traditional baby-delivering practice. This means that they took a lot of risk to delivery their babies at home. After 2007, most of women started using maternity nursing service at the clinics nearby. Since 2009, the clinic maternity nursing service has been widely used by women in the village.

In terms of education, before 2007, the accessibility to education was relatively low due to the poor road condition, school location and low living standard of families. Since 2007, the number of enrollment of children to study at school has been relatively increasing. According to the local residents, every child in the village is not able to go to school when she or he is 6 years old. Only 60% of those children can continue to higher education at Songkheurb High School 5 km from the village.

B) Survey in Chea Lear Village

(a) Chea Lear Village Representative Group of Local Residents

Chea Lear Commune where there are 1,495 families is composed of five villages among which Chea Lear Village consists of 515 families. There were only 12 local residents participating in this additional field interview. Their names and positions are listed as follow:

No.	Full name	Position
1	Cheurn Krak	Soldier/Farmer
2	Chap Chariya	Farmer
3	Kris Noeun	Farmer
4	Pal Py	Chea Lear Village Chief
5	Noun Ratha	Farmer
6	Noun Chin	Farmer
7	Chin Simon	Farmer

8	Ngat Sokchan	Farmer
9	Em Heap	Farmer
10	Sous Vang	Farmer
11	Kuot Cheurn	1st Chea Lear Commune Deputy Chief
12	Em Heam	Chea Lear Village Deputy Chief

(b) Results of the Survey

① Usage of Agricultural Machineries

Much similar to Sambo Village representative group of local residents, the main machineries used for agricultural purposes are combine (big tractor), walking tractor (small tractor), water pumping machine, and Pesticide fumigating machine. There are only four combines in the village: two bought in 2007 and other two in 2013.

Year	Number			
	Combine	Walking Tractor	Water-pumping machine	Pesticide fumigating machine
Before	0	0	17	0
2007	2	30	20	5 or 6
2008	0	38	30	12
2009	0	42	35	20
2010	0	43	37	22
2011	0	65	39	25
2012	0	82	42	27
2013	4	82	42	28

② Amount of Cultivated Land Using Agricultural Machineries

Similar to the representative group of local residents in Sambo Village, the amount of cultivated land inside the reservoir increased significantly. Before 2007, only 60 or 70 hectares of the land were able to be cultivated due to the lack of water. However, since 2007, the entire 290 hectares of land (220 hectares with land titles and other 70 hectares without land titles) have been used for cultivation because of enough water.

③ Multiple-Crop Production

In Chea Lear Village, farmers also grow only rice because of the soil condition unsuitable for other types of cropping. Much depending on the amount of water, the farmers in the village mostly cultivate rice only once per year. In some years when water is enough, they can do rice cultivation twice in every six month or even three times within a year.

④ Average Land Price

Similarly, the land is categorized into three types: Front land, middle land, and back land. Before 2007, the price of lands had no price because there was no any demand. After 2007, the land price increased significantly. Since 2009, the price of all types of lands fell down dramatically as the land demand decreased very fast.

Year	Types of Land	Price
Before	Front Land	N/A(no price)
	Middle Land	N/A(no price)
	Back Land	N/A(no price)
2007-2008	Front Land	USD 100,000$/ha
	Middle Land	USD 30,000-40,000$/ha
	Back Land	USD 50,000$/ha (next to the reservoir) USD 20,000$/ha (far from the reservoir)
2009-2013	Front Land	USD 30,000-60,000$/ha
	Middle Land	USD 1,000$/ha
	Back Land	USD 2,500-5,000$/ha

⑤ Cultural Accessibility:

There has been a big change of cultural accessibility since 2007. The table below details the estimated number of television, motorcycle, and bicycle in 2003, 2008, and 2013.

Year	Number		
	Television	Motorcycle	Bicycle
2003	100 (Black and White)	20	220
2008	200	230	220
2013	400	300	205

Moreover, people in Chea Lear Village find it more convenient to access to the clinic service also owing to three main reasons. First, the clinic is located near the village. Second, the road condition is better. Last but not least, there are many better transports. In 2008, most of women used the clinic maternity nursing service in the village, while in 2013 every pregnant woman receives the maternity nursing service in clinics where they think are convenient.

In terms of education, before 2007, the accessibility to education was a bit low due to three reasons: poor road condition, far distance from home to school and low living standard. Since 2007, the number of enrollment of children to study at school is relatively high. According to Mr. Pal Py, Chea Lear Village chief, there are 54 kids enrolling in kindergarten, over 500 children going to primary school, and around 300 teenagers studying at secondary school. Mr. Py is not sure about the estimated number of students going to high schools 5 or 6 km from the village.

Note: According to Mr. Pal Py, in Chea Lear village, the majority of people (over 400) are farmers. There are approximately 200 are public servants, 5 engineers, around 30 to 40 NGO staff members. Some people have two jobs. For example, they can be both famers and public servants because as the public servants, they get a very low salary (e.g. a month salary of teachers at primary school is around 300,000 riel equal to USD $75).

C) Document Survey on FWUC Operation and Management

a) Articles of FWUC Operation and Management

① The Sources of Budgets of FWUC

- Irrigation Service Fees from members of FWUC
- Funds from Royal Government of Cambodia, International Organizations, and other NGOs
- Profits from FWUC's business
- Fines and other taxes

② Expenditure

- Irrigation system reparation and maintenance
- Gasoline
- Functions of FWUC members
- Administration
- Other extra work

③ Specific Irrigation Service Fees

Services	Fees (Riel Per Hectare)
Draining	80,000R/ha in one season
Both Draining and Pumping	50,000R/ha in one season
Pumping	30,000R/ha in one season

Note: According to Mr. Ouk Vor, FWUC leader, the ISF plan has not been successfully implemented due to the fact that people are not willing to pay at all.

④ Fines (FWUC members)

Cases	Fees (Riel Per Hectare)
Absence in three consecutive meetings	15,000R or termination of membership
Absence from labor supply	10,000R or no water supply for 15 days
Stealing water from canals for cultivation	100,000R
Closing or opening water gates without permission	100,000R
Damaging irrigation system	100,000R
Setting cattle free along irrigation areas	5,000R
Weight of all transports exceeding 5 tons	50,000R
Threshing rice/paddy along canals/dikes	100,000R
Illegal fishnet to fish	100,000R
Shocking fish by using electricity	500,000R
Wasting water to water crops	100,000R
Explosive weapons to damage irrigation system	2,000,000R
Closing canals without permission	1,000,000R

⑤ Calculation of Water Cost per Hectare by FWUC

$$X = \frac{X1 + X2 + X3 + X4 + X5}{Total\ land\ surface} + 20\%\ of\ production\ growth\ rate\ per\ hectare$$

X is the spending on the operation and maintenance

- X1= spending on reparation and irrigation system maintenance
- X2= spending on gasoline
- X3= spending on function of FWUC
- X4= spending on administration
- X5= other extra work

Y is the cost of water usage:

Year	Government	Percentage	FWUC	Percentage
1	spending	80%	spending	20%
2		60%		40%
3		40%		60%
4		20%		80%
5		0%		100%

b) Other Findings

① Budget Plan for Five Years

Year	Activities	Budget (USD $)	Activities	Budget (USD $)
2010	Training, Meeting, Dissemination , etc.	2,000$	Facilities, maintenance, and reparation	4,000$
2011		2,000$		5,000$
2012		2,000$		7,000$
2013		2,000$		9,000$
2014		2,000$		10,000$
Five-Year Budget (Total)				350,000$

② Budget to Establish FWUC Office

The members of the FWUC, the majority of the local community, want to have an office of adminstration and other communal activities regarding FWUC operation and management in the village. According to Mr. Ouk Vor, FWUC leader, the amount of budget to establish a FWUC office (8m x 15m) is estimated to be between USD $15,000 and USD $20,000.

D) Reference Data and Figures Collected from Various Sources

(A) Socio-economic Development Indicators

a) National Level

b) Kampong Cham Province Level

c) Batheay District Level

d) Sambo Commune Level

e) Chea Lear Commune Level

(B) Survey on Education Service Accessibility

(C) Survey on Clinic Service Accessibility

(A) Socio-economic Development Indicators

a) National Level

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013p
Economic Indicators	Gross domestic product	Annual percentage change	13.3	10.8	10.2	6.7	0.1	6.0	7.1	7.3	6.5
	Population	Million people	13.3	13.5	13.7	13.9	14.1	14.3	14.5	14.8	14.7
	Sector GDP Performance	Agriculture, annual percentage change	15.7	5.5	5.0	5.7	5.4	4.0	3.1	4.3	3.2
		Industry, annual percentage change	12.7	18.3	8.4	4.0	-9.5	13.6	14.5	9.2	8.2
		Service, annual percentage change	13.1	10.1	10.1	9.0	2.3	3.3	5.0	8.1	7.4
	Economic structure	Agriculture, proportion of GDP (%)	32.4	31.7	31.9	34.9	35.7	36.0	36.7	35.6	
		Industry, proportion of GDP (%)	26.4	27.6	26.8	23.8	23.1	23.3	23.5	24.3	
		Service, proportion of GDP (%)	41.2	40.8	41.3	41.3	41.3	40.7	39.8	40.1	
	Per capita GDP	US Dollar	471	537	628	743	736	783	878	944	981
		PPP basis, US Dollar	1646	1,699	1,900	2,043	2,033	2,150	2,312	2,494	
	Consumer Price Index	Annual percentage change	5.8	4.7	5.9	19.7	-0.7	4.0	5.4	2.9	
	Budget	Total budget revenues, % of GDP				13.3	11.8	12.6	13.2	13.7	14.2
		Total budget expenditure, % of GDP	14.90			15.9	17.5	17.9	17.8	17.8	17.7
		Budget balance, % of GDP	-2.5	-2.7	-2.9	-2.8	-8.4	-7.5	-6.0	-5.8	
		Current Surplus, % of GDP				3.0	0.1	1.3	1.7	2.2	2.8
	Export volume	Million US Dollar	2908	3692.4	3247.8	3493.1	2995.7	3884.3	5219.5	3015.7	
	Import volume	Million US Dollar	3918.3	4771.2	4516.7	5076.7	4489.9	5466	6709.5	7964.9	
Social Indicators	Poverty rate	% of people under poverty line			47.8	29.9	22.9	21.1	19.8		
	Unemployment rate	Percentage of workforce				1.7	0.1	0.4	0.2		

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013p
		Nos				6,565	6,635	6,685	6,785	6,865	6,945
	Enrollment rate of primary school	Net Enrollment, %		95.4	96.8	96.0	95.0	95.9	98.2	97.5	98.0
		Boys, %				94.8	95.0	95.5	96.0	96.5	97.0
		Girls, %				94.0	95.0	96.0	97.0	98.0	99.0
	literacy rate	Percentage				77.6	73.9				
	Life Expectancy	Male, Years	57.87			60.5	60.65	61.35	62.04	62.73	63.43
		Female, Years	64.14			64.3	66.97	67.68	68.38	69.09	69.8
	Infant mortality rae	Per 1,000 live births	55.6	51.9	48.1	45	41.9	39	36.2		
Water Resources and Irrigation Agriculture and Rural Economy	Rainfall	Millimeter in the year									
	Water reserves	Metric ton per capita									
	Rural population	Thousand people	10,795	10,939	11,076	11,214	11,360	11,519	11,864	11,863	
	Rural household income	Riel									
	Arable land area	hectare per person	0.28	0.28	0.28	0.28	0.28	0.28	0.27		
	Paddy	Cultivated area, thousand hectare	2.37			2.61	2.63	2.65	2.65	2.65	2.65
		Yield, thousand ton	1.97			2.74	2.77	2.80	2.83	2.87	3.00
	Irrigation area	Thousand hectare				818,155	840,638	908,338	947,134		
	Production of rice	Thousand metric ton									
	Export of rice	Thousand metric ton	7,018	5,682	4,366	6,390	16,184	51,672	178,278	207,168	

b) Kampong Cham Province Level

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013p
Economic Indicators	Gross domestic product										
	Population	Million people				1.679			1.745		
	Number of District	Number	16	16	16	16	16	16	16	16	16
	Sector GDP Performance	Agriculture, annual percentage change									
		Industry, annual percentage change									
		Service, annual percentage change									
	Economic structure	Agriculture, proportion of GDP (%)									
		Industry, proportion of GDP (%)									
		Service, proportion of GDP (%)									
	Per capita GDP	US Dollar									
Social Indicators	Poverty rate	Portion of people under poverty line (%)									
	Unemployment rate	Percentage of workforce									
	Enrollment rate of primary school	Percentage				20.83%					
	Illiteracy rate	Percentage				23.69%					
	Life Expectancy	Years									
	Infant mortality rae	Per 1,000 live births									
Water Resources and Irrigation	Rainfall	Millimeter in the year			1536.5	1501.4	1770.4	1374.0	1393.1	1709.3	1709.3
	Water reserves	Metric ton per capita									
	Water dams	Number									
	Water reserves	Million metric ton									

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013p
	River dike	Kilometer in length									
	Irrigation Channel	Kilometer in length									
	Area damaged by flood	Hectare									
Agriculture and Rural Economy	Rural population	Thousand people									
	Rural household income	Riel									
	Arable land area	Thousand hectare									
	Paddy area	Thousand hectare									
	Irrigation area	Thousand hectare									
	Production of rice	Thousand metric ton									
	FWUC	Number of the Community									
	FWUC	Number of FWUC Members									
	Irrigation Service Fee	Riel									
	Farming Road	Kilometer in length									
	Paddy Production Productivity	Metric ton per hectare									
	Area of multi-crops	Hectare									
	Production of other crops										
Other indicators	Road										
	Road paved	Kilometer in length									

c) Batheay District Level

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013
Economic Indicators	Gross domestic product										
	Population	Family (Number)	N/A	N/A	22,039	22,556	22,947	22,971	23,361	24,808	N/A
		People (Number)	N/A	N/A	105,807	107,362	110,324	111,126	111,599	114,886	N/A
	Number of Commune	Number	12	12	12	12	12	12	12	12	12
	Sector GDP Performance	Agriculture, annual percentage change								88.40%	
		Industry, annual percentage change								5.40%	
		Service, annual percentage change								6.20%	
	Economic structure	Agriculture, proportion of GDP (%)									
		Industry, proportion of GDP (%)									
		Service, proportion of GDP (%)									
	Per capita GDP	US Dollar									
Social Indicators	Poverty rate	Portion of people under poverty line (%)				31%					24%
	Unemployment rate	Percentage of workforce				45.87%					
	Enrollment rate of primary school	Percentage				19.27%					
	Illiteracy rate	Percentage				28%					
	Life Expectancy	Male (Year)									est. 65
		Female (Year)									est. 67
	Infant mortality rae	Per 1,000 live births									
Water Resources and Irrigation	Rainfall	Millimeter in the year	N/A	1,120	954	861	1,075	1,248	1,013	1,234	823
	Water reserves	Metric ton per capita									
	Water dams	Number	210	210	210	210	210	210	210	210	210
	Water reserves	Million metric ton									
	River dike	Kilometer in length									
	Irrigation Channel	Kilometer in length									
	Area damaged by flood	Hectare							12,600		

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013
Agriculture and Rural Economy	Rural population	People	N/A	N/A	105,807	107,362	110,324	111,126	111,599	114,886	N/A
	Rural household income	Riel									
	Arable land area	hectare	36,890	36,890	36,890	36,890	36,890	36,890	36,890	36,890	36,890
	Paddy area	hectare	36,890	36,890	36,890	36,890	36,890	36,890	36,890	36,890	36,890
	Irrigation area	Inside (hectare)	3500 -8000	3500 -8000	3500 -8000	3500 -8000	3500 -8000	3500 -8000	3500 -8000	3500 -8000	3500 -8000
		Outside (hectare)	2800 -3000	2800 -3000	2800 -3000	2800 -3000	2800 -3000	2800 -3000	2800 -3000	2800 -3000	2800 -3000
	Production of paddy	Inside (ton per hectare)	3	3	3 - 3.5	3 - 3.5	3 - 3.5	3 - 3.5	3 - 3.5	3 - 3.5	3 - 3.5
		Productivity (thousand tons)	10.5-24	10.5-24	10.5-28	10.5-28	10.5-28	10.5-28	10.5-28	10.5-28	10.5-28
		Outside (ton per hectare)	3.5	3.5	3.5 - 4	3.5 - 4	3.5 - 4	3.5 - 4	3.5 - 4	3.5 - 4	3.5 - 4
		Productivity (thousand tons)	9.8-10.5	9.8-10.5	10.5-12	10.5-12	10.5-12	10.5-12	10.5-12	10.5-12	10.5-12
	FWUC	Number of the Community									
	FWUC	Number of FWUC Members									
	Irrigation Service Fee	Riel									
	Farming Road	Kilometer in length	18	18	18	18	18	18	18	18	18
	Area of multi-crops	Hectare	0	0	0	0	0	0	0	0	0
	Production of other crops		0	0	0	0	0	0	0	0	0
Other indicators	Road										
	Road paved										
	National Road	Road No 61 (Kilometer in length)	12	12	12	12	12	12	12	12	12
		Road No 6 (Kilometer in length)	34	34	34	34	34	34	34	34	34

d) Sambo Commune Level

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013
Economic Indicators	Gross domestic product										
	Population	Family (number)	2,327	2,464	2,464	2,539	2,597	2,597	2,611	2,699	2,790
		People (Number)	11,426	11,651	11,676	11,913	12,074	12,192	12,313	12,811	12,949
	Number of Village	Number	7	7	7	7	7	7	7	7	7
	Sector GDP Performance	Agriculture, annual percentage change									est. 95%
		Industry, annual percentage change									est. 4%
		Service, annual percentage change									est. 1%
	Economic structure	Agriculture, proportion of GDP (%)									
		Industry, proportion of GDP (%)									
		Service, proportion of GDP (%)									
	Per capita GDP	US Dollar									
Social Indicators	Poverty rate	Portion of people under poverty line (%)				N/A					est. 65%
	Unemployment rate	Percentage of workforce									
	Enrollment rate of primary school	Percentage									
	Illiteracy rate	Percentage								30%	
	Life Expectancy	Years								est. 60s	
	Infant mortality rate	Per 1,000 live births								est. 60s	
Water Resources and Irrigation	Rainfall	Millimeter in the year									
	Water reserves	Metric ton per capita									
	Water dams	Number	37	37	37	37	37	37	37	37	37
	Water reserves	Million metric ton									

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013
	River dike	Kilometer in length									
	Irrigation Channel	Kilometer in length	13	13	13	13	13	13	13	13	13
	Area damaged by flood	Hectare								50	
Agriculture and Rural Economy	Rural population	People	11,426	11,651	11,676	11,913	12,074	12,192	12,313	12,811	12,949
	Rural household income	Riel									
	Arable land area	Hectare	5,529	5,529	5,529	5,529	5,529	5,529	5,529	5,529	5,529
	Paddy area	Hectare	5,529	5,529	5,529	5,529	5,529	5,529	5,529	5,529	5,529
	Irrigation area	Hectare	N/A	N/A	1,948	1,948	1,948	1,948	1,948	1,948	1,948
	Production of paddy	Ton per hectare	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
		Productivity (thousand tons)	16.59	16.59	19.35	19.35	19.35	19.35	19.35	19.35	19.35
	FWUC	Number of the Community	0	0	0	0	1	1	1	1	1
	FWUC	Members (O&M) (Number)	0	0	0	0	52	52	52	52	52
		Members using water (Number of family)									
	Irrigation Service Fee	Riel									
	Farming Road	Kilometer in length	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6	12.6
	Area of multi-crops	Hectare	0	0	0	0	0	0	0	0	0
	Production of other crops		0	0	0	0	0	0	0	0	0
Other indicators	Road										
	Road paved	Kilometer in length	12	12	12	12	12	12	12	12	12

e) Chea Lear Commune Level

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013p
Economic Indicators	Gross domestic product										
	Population	Family (Number)	1,349	1,375	1,403	1,429	1,456	1,480	1,504	1,529	1,555
		People (Number)	6,585	6,719	6,356	7,031	7,169	7,271	7,416	7,561	7,584
	Number of Village	Number	5	5	5	5	5	5	5	5	5
	Sector GDP Performance	Agriculture, annual percentage change									85%
		Industry, annual percentage change									7%
		Service, annual percentage change									3%
	Economic structure	Agriculture, proportion of GDP (%)									
		Industry, proportion of GDP (%)									
		Service, proportion of GDP (%)									
	Per capita GDP	US Dollar									
Social Indicators	Poverty rate	Portion of people under poverty line (%)				45%					22%
	Unemployment rate	Percentage of workforce									
	Enrollment rate of primary school	Percentage									
	Illiteracy rate	Percentage									0.70%
	Life Expectancy	Male (Years)								65	
		Female (Years)								67	
	Infant mortality rae	Per 1,000 live births						1	0	0	0
Water Resources and Irrigation	Rainfall	Millimeter in the year									
	Water reserves	Metric ton per capita									
	Water dams	Number	23	23	23	23	23	23	23	23	23
	Water reserves	Million metric ton									

Indicators		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2013p
	River dike	Kilometer in length									
	Irrigation Channel	Kilometer in length	45	45	45	45	45	45	45	45	45
	Area damaged by flood	Hectare							137		
Agriculture and Rural Economy	Rural population	People	6,585	6,719	6,356	7,031	7,169	7,271	7,416	7,561	7,584
	Rural household income	Riel									
	Arable land area	Hectare	3025	3025	3025	3025	3025	3025	3025	3025	3025
	Paddy area	Hectare	3025	3025	3025	3025	3025	3025	3025	3025	3025
	Irrigation area	Hectare	1,251	1,251	1,251	1,251	1,251	1,251	1,251	1,251	1,251
	Production of rice	Ton per hectare	3	3	3.5	3.5	3.5	3.5	3.5	3.5	3.5
		Productivity (thousand tons)	9.08	9.08	10.59	10.59	10.59	10.59	10.59	10.59	10.59
	FWUC	Number of the Community	0	0	0	0	1	1	1	1	2
	FWUC	Members (O&M) (Number)									
		Members using water (Number of family)					846	846	846	846	846
	Irrigation Service Fee	Riel									
	Farming Road	Kilometer in length									
	Area of multi-crops	Hectare	0	0	0	0	0	0	0	0	0
	Production of other crops		0	0	0	0	0	0	0	0	0
Other indicators	Road										
	Road paved	Kilometer in length	4	4	4	4	4	4	4	4	4

(B) Survey on Education Service Accessibility

Four schools: Hun Sen Songkheurb secondary school, Sambo primary school, Songkheurb primary school, and Pnov primary school

School	Academic year	Number							
		Student (Total)	Female	School dropping	Female	%	Entrance into higher grade	Female	%
Songkheurb secondary school	2006-2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2007-2008	191	99	21	8	10.99	156	79	91.76
	2008-2009	319	163	14	9	4.38	305	154	95.6
	2009-2010	460	232	62	36	13.47	354	172	76.95
	2010-2011	456	229	54	30	11.84	356	175	78.07
	2011-2012	460	223	79	45	17.17	338	157	73.47
	2012-2013	452	216	82	37	18.14	333	164	73.67
Sambo primary school	2006-2007	936	469	41	23	4.38	806	391	86.11
	2007-2008	879	422	46	23	5.23	771	358	87.71
	2008-2009	874	404	21	5	2.40	801	378	91.64
	2009-2010	836	388	24	8	2.87	770	364	92.10
	2010-2011	847	400	19	9	2.24	787	372	92.91
	2011-2012	754	356	11	5	1.46	715	334	94.82
	2012-2013	628	334	3	2	0.44	643	314	94.28
Songkheurb primary school	2006-2007	656	305	31	13	4.72	564	253	85.37
	2007-2008	584	257	26	13	3.29	512	213	87.35
	2008-2009	604	254	17	9	2.81	541	222	89.56
	2009-2010	607	259	28	13	4.61	560	236	92.25
	2010-2011	581	257	23	8	3.95	539	243	92.77

School	Academic year	Number							
		Student (Total)	Female	School dropping	Female	%	Entrance into higher grade	Female	%
	2011-2012	570	257	12	4	2.10	537	244	94.21
	2012-2013	533	248	11	4	2.06	502	234	94.18
Pnov primary school	2006-2007	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	2007-2008	703	344	24	8	3.44	604	305	86.78
	2008-2009	693	343	27	13	3.90	623	308	89.89
	2009-2010	707	335	18	7	2.54	652	308	92.22
	2010-2011	674	312	8	7	1.18	626	282	92.87
	2011-2012	612	300	7	5	1.14	583	285	95.26
	2012-2013	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: % = Total Percentage; N/A = No Available Data

(C) Survey on Clinic Service Accessibility

Sambo Healthcare Clinic is located in Sambo village, Sambo commune, Batheay district, Kompong Cham province, Cambodia

① Total number of Patients

	Year	Zone A	Zone B	Zone C	Male	Female	Total
TNC	2008	3,537	1,485	313	2,091	3,244	5,335
TC		3,666	1,550	323	2,161	3,378	5,539
TNC	2009	5,440	4,054	655	3,864	6,285	10,146
TC		5,721	4,235	731	4,032	6,655	10,687
TNC	2010	4,054	3,525	958	3,384	5,153	8,537
TC		4,108	3,608	993	3,457	5,252	8,709
TNC	2011	4,219	3,259	1,419	3,647	5,250	8,897
TC		4,399	3,378	1,459	3,765	5,471	9,236
TNC	2012	4,632	4,544	969	4,324	5,821	10,145
TC		4,819	4,685	1,002	4,454	6,052	10,506

Note: TNC = Total New Cases; TC = Total Cases
- Zone A: The village where Sambo Healthcare Clinic is located
- Zone B: Outside the village where Sambo Healthcare Clinic is located but in responsible areas of the clinic
- Zone C: Other areas

② Total Number of Antenatal Cares, Delivery, Post-partum Cares, and Birth Spacing

Year	Total number					
	Antenatal Cares	Delivery			Post-partum Cares	Birth Spacing
		Clinic	Home (Clinic staff)	Home (Traditional)		
2008	621	91	128	15	432	1,456
2009	1,284	261	5	0	547	1,410
2010	1,053	251	0	0	648	1,854
2011	988	235	0	1	450	2,314
2012	1,018	257	0	0	483	2,415

4. Evaluation Report of the Local Consultant

Evaluation Report

Flood Control and Irrigation System Construction Project in Batheay District, Kampong Cham Province, Kingdom of Cambodia

THEAM, SOKVIBOL

Senior Local Consultant,

Korea Global Development Consulting, KGDC

September 12, 2013

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A. BACKGROUND OF THE PROJECTS

On February 8, 2007, the Government of the Republic of Korea and the Royal Government of Cambodia (RGC) through the Korean International Cooperation Agency (KOICA) and the Ministry of Water Resources and Meteorology (MoWRAM) respectively agreed on a USD $2,452,015 Flood Control Construction Project to be conducted in Kampong Cham Province's Batheay District, Cambodia. The project was believed to help protect about 2,500 hectares of farmland from the annual flood from Tonle Sap River during rainy season and supply agricultural water during dry season. The total amount was a share between USD $1,790,600 from the Korean Government for the construction project and USD $661,415 from the RGC for compensating farmers for their affected land.

Two years later, on February 28, 2009, the two Governments agreed on an extension of the Flood Control Construction Project to build an irrigation system, consisting of nine main canals of 18.1 kilometers in length. Out of the total cost of USD $2,686,740 for this Irrigation System Construction Project, the RGC contributed USD $383,740 to compensate farmers for their affected land.

As an immediate result, a large area of farmland both inside and outside of the dike has been, to a large extent, saved from flood annually as well as supplied with water for farming during dry season. The project has benefited 5,650 families living in two communes, Sambo and Chealear, enabling them to boost crop yield and cultivate multiple times.

Therefore, this report is intended to evaluate the two projects from an independent local development expert's perspective with a one-week site observation and interviews with government officials and local authority in charge as well as the community and local residents. The evaluation will be done based on five main pillars: Relevance, efficiency, effectiveness, impact, and sustainability. Finally, recommendations to various relevant entities are provided.

B. EVALUATION RESULTS

Relevance

The Flood Control and Irrigation System Construction Projects in Batheay District, Kampong Cham Province, entail a great degree of relevance to the Agriculture Sector Strategic Development Plan of the Ministry of Agriculture, the Rectangular Strategies of the RGC, and the overall Millennium Development Goals of the United Nations.

These two projects have apparently provided an increase in market access, productivity, and irrigation and also improvement in farming techniques, and these are among the prime objectives of the Agricultural Sector Strategic Development Plan. First, the 13.6 kilometer dike has functioned as a convenient transportation means for farmers to deliver their harvests more direct and efficient to the market. More or less, this brings a significant reduction of unnecessary employment of middlemen and also costs that would otherwise be incurred by poorer transportation means. Secondly, the construction allows farmers in Sambo and Chealear communes whose farmlands are located inside the 2,220 hectare reservoir to do multiple cropping up to three times a year and those owning farmlands outside the basin over 3,500 - 8,000 hectares of land to do farming in the dry season. Prior to the projects, farmers were able to cultivate their crops only once a year even with a lot of difficulty owing to either big threats of damage brought about by flood or the drought during dry season. Today, the dam controls flood water from damaging the crops and stores enough valuable water to irrigate farmlands across seasons. Apart from being able to cultivate multiple times per year, farmers are also able to boost their yield per hectare per cultivation due to their improve techniques and the sufficient amount of water. Before the projects, one hectare of farmland yielded only 2.5-3 tons per cultivation. After the projects, however, the yield rises to 3-4 tons. Moreover, with enough water throughout the two seasons, farmers are able to cultivate early cropping and other kinds of cropping multiple times per year, so we have seen the applications of modern tools and machineries in

their farming practices in order to keep up with the shorter time of each of the multiple cultivations. Today, in each village, there are about 20 rice farming machineries owned by the villagers, and other fellow villagers can also rent them to cultivate their own farmlands.

In addition, The Flood Control and Irrigation System Construction Projects supported by KOICA contribute to the Rectangular Strategies of the RGC: "Improving agricultural productivity and diversification." As having mentioned earlier, today, with one hectare of farmland, farmers are able to produce more between 3-4 tons due to improved techniques and the sufficient quantity of water. Also, other than doing rice farming, villagers are growing other crops, e.g. cucumber, and raising livestock, e.g. duck and pig, and fish.

Apart from those, the projects contribute to the overall Millennium Development Goals (MDGs) of the United Nations (UN). Local residents in the two communes have better standard of living because of the higher income they make from higher productivity. Children now can go to school regularly and get better grades because they have to worry much less about flooded roads and schools. Improved transportation means allow mothers and villagers as a whole to get more convenient access to health services. Most importantly, the projects definitely strengthen global partnership, particularly between Cambodia and the Republic of Korea. Overall, the projects take part in reducing poverty, promoting education and health service access, and tightening the partnership among countries, which are major components of the MDGs.

Efficiency

From the construction side, selecting the PISNOKA International Corporation as the sub-contractor under the Yooshin Engineering Cooperation has proved to be a very efficient choice. PISNOKA has exhibited their competence and capability in following the set standard measures of construction to ensure neatness and safety at the construction site. Plus, they possessed enough necessary heavy equipment, not to mention the light ones, so they could self-make most of the basic materials for the construction at the site without

having to transport them from the downtown areas. In addition, they provided up to one year maintenance services, which doubled the normal period of the post-construction maintenance services.

After the completion of the construction, a Farmer Water User Community (FWUC) was established to be in charge of the operation and maintenance (O&M) of the dam, the water gates, and other facilities. There were proper selection and division of the community members and necessary O&M trainings for them. There is also a mechanism for communication between the community and MoWRAM in order to exchange information and especially needs.

However, based on the interviews with various beneficiaries, it is apparent that the involvement of the local residents in the planning and implementation of the projects is limited. Basically, all of local residents are aware of the presence of the project. Nevertheless, a majority of them reported that they did not take any significant part in the planning and implementation process. Instead, the village chiefs only went to their to house to get their signature as the evidence of them showing support, and the village chiefs did not inform any further or elicit the actual needs and opinions from those villagers. As a result, today, many villagers who live in Sangkeurb and Chealear villages, just to name a few, are unhappy about the projects. They critically claimed that the projects do not do any good for their family but make their living condition, especially their farming practice, even worse. These villagers asserted that the management of the projects within the FWUC is not transparent. There is steep competition among the farmers for water.

Effectiveness

The prime objectives of these projects are to control and reduce the damage caused by flood and to provide water to irrigate farmland in Sambo and Chea Lear communes.

In terms of flood control, these projects have done little to protect the

farmers' farmlands from flood. Evidently, in 2011, about six months after the completion of the second phase project, not only did a heavy flooding destroy the farmers' crops in the area, but the dike itself was severely damaged. In the following years, the area has not experienced any flooding from the river anymore. So, it can be assessed that the projects have done little so far to protect the farmlands from flood. Having said this, we cannot say for certain that the projects are not able to control flood. It is just that there is little so far that the projects have done with regards to controlling flood. We need more evidence to make the judgment. Now, it is too early to say.

On a separate line, however, the projects have been successfully completed. Farmlands at over 2,220 hectares inside the basin and especially those 3,500-8,000 hectare farmlands outside the reservoir in the Sambo and Chealear commune are now irrigated despite the fact that during certain years, low water cannot supply abundant water for irrigation so Sae farmlands still lack water. Today, the 3,500-8,000 hectares outside the basin become arable land during dry season. The 2,220 hectares inside the basin now allow multiple cropping. Virtually all families grow rice twice or even three times a year compared the once-a-year heavy seed rice farming that farmers practiced before the implementation of the projects. Today, farmers grow rice for a shorter period, three months to be precious. Therefore, they have practiced new agricultural techniques and grown different kinds of rice. Each village now processed around 20 heavy farming machineries. Rarely are cattle employed in farming. More importantly, villagers can get self-employed all year round. They do not need to migrate to other area to look for job during the off-farming season.

In addition, per hectare cultivation as having mentioned earlier, the yield increases from 2.5-3 tons to 3-4 tons due to sufficient supply of water and improved farming techniques. So, the practice of multiple cropping and the better yield enable the local residents to make more income and thus improve their livelihood. The new and improved transportation means have

made their lives, especially women, much more convenient. Women can save lots of time for doing housework and taking care of the children and the entire family, other than helping with the field work.

Apart from the construction, the operation and maintenance of the facilities and the functioning of the FWUC have been on a negative side. After the construction, the community depends so much on the Irrigation Service Fee (ISF) that the FWUC collect from every farmer. Farmers have to pay a certain amount depending on the size of their farmlands and the means of supplying water. If water needs to be only drained, 80,000 Riels (about USD $20) is charged. If it has to be both pumped and drained, 50,000 Riels is charged. For only pumped, 30,000 Riels is charged. Recently, however, farmers have refused to pay the ISF because they claimed they did not see any services provided by the FWUC. In my opinion, the underlying reason for this entails the competition for water that has been raised above. Sae farmers are not happy, so they do not pay the fee, and neither do other farmers.

Furthermore, there are Sae other maintenance issues that have not been managed appropriately. The flood in 2011 damaged the dam severely, and the repair process was not carried out carefully. The fills of the damaged parts of the dam were not hardened properly. Now, rain water has caused erosion and created so many dragon holes, which makes it so difficult to travel on the dam. Sae of the water gates were positioned a little higher than the crops. As water cannot be drained outside because the level of the water is lower than the water gates, either crops in the land inside the basin next the dam are destroyed or farmers cannot make use of the land in that area. So far, it has been reported that very minimal effort, if any has been put into maintaining the dam, making minor damages become serious. Therefore, these have caused a vicious circle. When there little, or no, O&M, the farmers refuse to pay the ISF to the FWUC, and when there is no ISF, O&M cannot be done.

Impact

Admittedly, the Flood Control and Irrigation System Construction Projects presented great impacts local residents, the authorities, as well as the country as a whole.

First and most importantly, the projects positively influence the socio-economic status of the local residents in various ways. Farmers begin to use advanced, technological agricultural practices to replace the traditional ways of doing farming. They start to practice different ways of cropping. These can advance their skills and experience in farming, making them much more flexible and less vulnerable. Another fascinating observation after the completion of the projects is that the values of farmlands in the area rose exponentially. Generally speaking, this phenomenon is caused by a number of factors, but based on what the farmers believe, the construction of the irrigation system and flood control has a big contribution in the rise of their land prices. Roughly, the average price of farmland climbed from just over USD $1,000 per hectare before the projects to over USD $10,000 per hectare. These eventually promote the wellbeing of the local residents. Women now no longer need to travel to the rice field to take the packed meal for their husbands because they can actually make their way home a lot more easily. So, there is no need for the husbands to stay at the field the entire day. Now, women have more time to take part in other social activities and take care of their households and children. Children, too, are able to go to school much more conveniently.

Additionally, these projects have presented a new management practice and problem-solving experience for the community as well as the local authority at both national and subnational levels. The FWUC, as having mentioned earlier, have had up and down time for the O&M of the facilities. Initially, they were trained and implemented the O&M very well by collecting ISF regularly. After a couple of years, O&M has been a challenge for FWUC. They become incapable of collecting fees regularly since maintenance has not been done properly. Now, the FWUC is struggling with its own existence and

sustainability. At district level, these projects serve as a unique experience in terms of collecting water fee. We have seen conflict of interest among local residents that the district office has to deal with. They have also experienced the difficult situations when they had to intervene in the O&M when there were Sae major damages to the facilities. Based on the district governor, all these challenges made him and his entire office to work for solutions. Similar lessons can be learned by MoWRAM at the national level. MoWRAM officials, particular those at the General Department of Technical, can get more experience working with KOICA, such as following standard, meeting requirements, etc. They also took part in the implementation of the project and the maintenance. They have also learned the importance of making concrete bank of the dam in order to make the facility stronger and much more durable. So, these are valuable lessons for authorities at various levels, ranging from the local community and district office to the concerned ministry, to learn and improve their practices. Lastly, these projects help strengthen relationship between the two countries and peoples. All the local villagers are aware of the support from the Korean Government in constructing the flood control and irrigation system, and they are very thankful and grateful for this support and hope the two countries continue such a good relation.

Sustainability

Based on the observation, these projects and their management have shown little sign of long-term sustainability. First, there is a lack of financial support from the local and central government. The central government has limited budget for this sector, and thus the provincial department as well as the district office are not capable of carrying out sufficient maintenance. The central government in 2011 financially supported the reparation of the facilities destroyed by the flood; however, it was carelessly done, making the facilities not functioning well in just a short period after the reparation. Since O&M requires financial availability, these pose a major constraint in the sustainability of the projects. Today, O&M depends to a great extent on the ISF. Now, FWUC is not functioning well either. They are unable to collect fee,

and they do not have the ability to do the O&M. So, this worsens the situation. Basically, there is a huge lack of sense of ownership among the residents. Residents do not take responsibility of the maintenance of the facilities. Sae even believe that it is the community or the authority who have to be responsible. To be precise, there is a tragedy of the commons in this situation. When everyone is responsible for the same thing, then nobody will actually take responsibility.

One underlying factor is the fact that farmers do not find the facilities helpful or reliable in providing them with water for farming. Today, many families use ground water for farming. This makes Sae family even believe that the projects actually make their living and farming conditions worse. The functions of the facilities themselves are also overdependent on the flood water and water from the river. During seasons with low or small water, they do not have sufficient amount of water to irrigate a lot of farmlands. So, there is little they can do during these circumstances.

All in all, if this scenario is going to prevail, it poses great danger to the sustainability of the projects.

C. RECOMMENDATIONS

The followings are the recommendations to different entities.

The Royal Government of Cambodia (RGC)

Below are Sae recommendations for the RGC:

- Ensure effective communication: The RGC, particularly MoWRAM, should inform the local authority at the sub-national level as well as the local residents clearly about any development plan. Moreover, they should also conduct Sae public survey to hear what local residents need so that we can design the development project to reflect those needs.

- Process and publicize information and reports among all relevant stakeholders: We have observed that there is so much difficulty in obtaining information about the projects. This does not apply to these

particular projects, but most of the development projects. Either it is hard to access the information, or the information is not available. In addition, the authorities do not seem to know exactly where the information can be obtained. So, often times, they actually pointed at each other.

❖ Empower local authority by allocating necessary annual budget to carry out O&M: We have also found that the Provincial Department of Water Resources and Meteorology has very limited amount of annual budget allocated by MoWRAM for them to carry out O&M and other development in the entire Kampong Cham Province. So, they also complained that when they are not able to fix minor damages of a construction, that leaves the damage to grow bigger and bigger and hard to fix. The district office also encounters the same problem.

❖ Continue good relationship with funding agencies and identifying areas of partnership: The RGC has done well in maintaining good relationship with funding agencies. So, it is important to continue this good relationship as well as try to look for areas that are in urgent needs for development in order to propose for more funding.

Funding Agencies

Below are Sae recommendations for the RGC:

❖ Conduct thorough feasibility study and design: We have learned that the feasibility study was conducted by a team of Korean experts in about one week. This is too short. Feasibility study should be conducted much more thoroughly so that all the facilities will be put in place properly.

❖ Ensure durability and sustainability of the project: Concreteness should be emphasized in the construction of such projects since without concrete base, the structure is prone to damage since they have to withstand flood water and other potential sources of damage.

Local Authority

Local authority should:

- ❖ Carefully study and identify the needs of the local residents and the problems they face: This is important for any development project to address the needs of the local residents and make sure the project benefits a large majority, if not all, of them.

- ❖ Carry out and encourage immediate problem solving: Delayed solution or reparation to a minor problem or damage will make it get bigger and bigger, and eventually it is out of control.

Community / Local Residents

The community and local residents should:

- ❖ Promote mutual understanding: A development project definitely cannot benefit every person equally, so it is important that every villager be open-minded and not compete with each other over the shared benefits.

- ❖ Take ownership and lead in O&M: Villagers should consider the facilities as belonging to them and take a good care as much as they can in terms of operation and maintenance. This is the best way to make the facilities and the projects sustainable.

- ❖ Strengthen cooperation with the community: Since the FWUC plays important role in O&M, empowering them is a must. So, local residents have to trust and cooperate with the community as much as possible.

5. Results of Questionnaire Survey

1. Outline

As the two projects - Flood Control and Irrigation System Construction - had been implemented in a closely related context, the basic design of the ex-post evaluation on the projects were planned within an integrated research and survey scheme. Therefore, interviews, site visits, questionnaire surveys, and meetings and discussions as well as the projection of evaluation matrix were prepared in a same portfolio of evaluation research and survey.

The plan for questionnaire survey on main stakeholders of the projects classified the two groups of direct beneficiaries: (1) farmers and local residents in the project area; and (2) members of the Farmer Water Use Community (FWUC). For each group of beneficiaries, a questionnaire survey form was developed and the questionnaire included around two dozens of fairly simple questions so that the answers could clarify the performance of the projects produced.

Each group of respondents were selected by the local leaders in guidance of the local consultants. The two commune leaders - Sambo and Chea Lear - selected the 20(twenty) respondents of 'Questionnaire to Local Residents and Beneficiaries' Questionnaire. The Chairman of the FWUC selected the 10(ten) respondents of 'Questionnaire to FWUC Members/Representatives.

The questionnaire survey was conducted during the 1st field research and survey mission in the 1st week of September 2013. However, the survey results proved that a number of the answers were not credible enough lacking respondent's identification and missed answers. In order to make the results of questionnaire more credible a complementary questionnaire survey was conducted during the 2nd field trip to Batheay region in the last week of September 2013. The followings are the results of the questionnaire surveys into which the eligible answers of the two surveys were integrated.

2. List of the Questionnaire Respondents

A) List of Local Residents/Beneficiaries

No.	Name in Khmer	Name in English	Sex	Position	Commune	Interview Date
1	អ៊ិន សំអុល	Inn Sa Ol	M	Farmer	Sorngkeurb	22 Sep 2013
2	គីម លុយ	Kim Luy	M	Farmer	Sorngkeurb	22 Sep 2013
3	អ៊ិន ធឿម	Inn Toeum	M	FWUC Member	Sorngkeurb	22 Sep 2013
4	ស ណន	Sa Nan	F	Farmer	Sorngkeurb	22 Sep 2013
5	ឈុំ នីតិ	Chum Nith	M	Farmer	Sorngkeurb	22 Sep 2013
6	ជប ថល	Chorb Thol	M	Farmer	Sorngkeurb	22 Sep 2013
7	ជីម មន	Chim Meoun	M	Farmer	Sorngkeurb	22 Sep 2013
8	ធន	Thoeun	M	Farmer	Sorngkeurb	22 Sep 2013
9	ជិន សុកគង	Chin Sok Kong	M	Farmer	Chea Lear	22 Sep 2013
10	ញឹម ឌើរឿ	Nhem Doeurn	M	Farmer	Chea Lear	22 Sep 2013
11	មល់ វិសល	Mol Visal	M	Farmer	Sorngkeurb	22 Sep 2013
12	ស ន	Shin	F	Farmer	Chea Lear	22 Sep 2013
13	ដម ស៊ីថន	Dam Sithan	M	Farmer	Sorngkeurb	22 Sep 2013
14	សន គឹមហង	Shon Kimhong	F	Farmer	Sorngkeurb	22 Sep 2013
15	ជប សយ	Choub Soy	M	Farmer	Sorngkeurb	22 Sep 2013
16	តាក់ចនន៊ី	Tak Channy	F	Farmer	Sambo	05 Sep 2013
17	សន ចនន	Son Channy	F	Farmer	Sambo	05 Sep 2013
18	ហូ ចនាក់	Ho Channa	F	Farmer	Sambo	05 Sep 2013
19	មស ជិន	Mos Chin	M	Farmer	Sambo	05 Sep 2013
20	សន ម	Sronn Mei	M	Farmer	Sambo	05 Sep 2013

B) List of FWUC Members

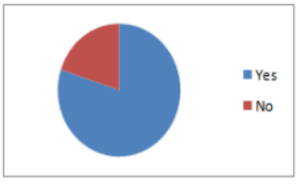
No.	Name in Khmer	Name in English	Sex	Position	Commune	Interview Date
1	ឡេង លន់	Leng Lon	M	FWUC Member	Sambo	05 Sep 2013
2	ជរ ជម	Chor Chim	M	FWUC Member	Sambo	05 Sep 2013
3	បន្ន សផល	Binn Sophal	M	FWUC Member	Sambo	05 Sep 2013
4	ស ពៅ	Sompov	M	FWUC Member	Sambo	05 Sep 2013
5	យែម យន	Yem Yorn	M	FWUC Member	Sambo	05 Sep 2013
6	ជន ហៀប	Chin Hearb	M	FWUC Member	Sambo	05 Sep 2013
7	ន វន	Vann Vorn	M	FWUC Member	Sambo	05 Sep 2013
8	សម ឈើម	Som Ream	M	FWUC Member	Sorngkeurb	05 Sep 2013
9	ផៃ ភឿង	Phay Phoeurng	M	FWUC Member	Sorngkeurb	05 Sep 2013
10	ជប ឈើន	Chub Cheurn	M	FWUC Member	Sambo	05 Sep 2013

3. Graphic Description of Questionnaire Survey Results

A) Answers of Local Residents and Farmers

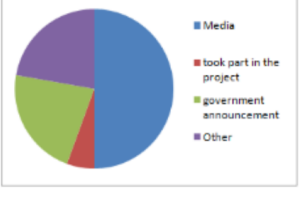
(A) Regarding the Cooperation Project

1-1. Do you know the fact that this project was assisted by the Korean Government?



Response	Rpdent.	Percent.
Yes	16	80%
No	4	20%

1-2. If your answer of question 1-1 is 'Yes', how did you know?

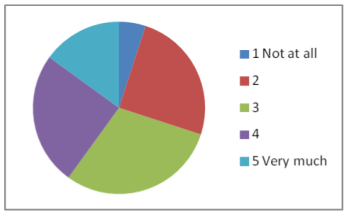


Response	Rpdent.	Percent.
Media	9	50%
Took part the project	1	6%
Government announcement	4	22%
Other	4	22%

Other answers:

- I saw Cambodian and Korean flag on the signboard.
- I knew it from my friends/relatives (hearsay).
- Korean experts came and interviewed residents.
- I saw Korean people.

1-3. Do you know this project has reflected local residents' opinions and suggestions?

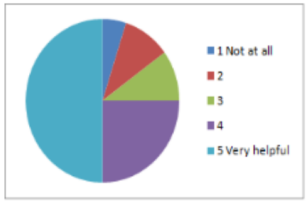


Response	Rpdent.	Percent.
1 Not at all	1	5%
2	5	25%
3	6	30%
4	5	25%
5 Very much	3	15%

1-4. If your answer of question 1-3 is negative, why do you think so?

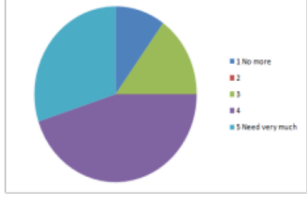
- I did not know the project well.
- I did not participate in the project.

1-5. Do you think this project is helpful for you and your community?



Response	Rpdent.	Percent.
1 Not at all	1	5%
2	2	10%
3	2	10%
4	5	25%
5 Very helpful	10	50%

1-6. Does your community still need more water for agriculture in addition to these KOICA project?



Response	Rpdent.	Percent.
1 No more	2	10%
2	0	0%
3	3	15%
4	9	45%
5 Need very much	6	30%

1-7. Do you think new facilities installed by the projects are functioning well?

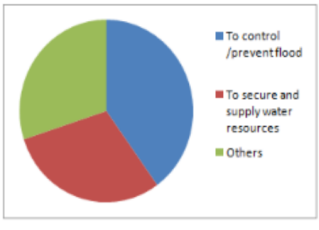
Response	Rpdent.	Percent.
1 No more	0	0%
2	0	0%
3	2	10%
4	9	45%
5 Very well	9	45%

1-8. If you are not satisfied with the way how new facilities are functioning, please describe main constraint or deficiency and your suggestion.

- I am quite satisfied with the new facilities because the irrigation system is functioning quite well, and there are just small damages (minor dragon holes) to the dikes.
- I would like Government of Republic of Korea to repair the dikes/irrigation system.
- I would like to request for one more water pumping station to bring water to the fields.
- I am not really satisfied with the new facilities due to its operation. Most of the water inside the reservoir is drained to water crops in the land outside the reservoir from November to December.

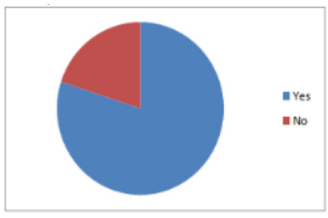
  Therefore, the water in lower lands is not sufficient.
- I was satisfied with the facilities before. But, now my satisfaction faded away because of the improper function of those facilities.
- I really urge Korean government to have appropriate O&M system.

1-9. What kind of further improvements do you expect on this projects?



Response	Rpdent.	Percent.
To control /prevent flood	8	40%
To secure and supply water resources	6	30%
Others	6	30%

1-10. Do you think your community need further assistance from external development partners (such as KOICA) for water resources management and irrigation? (including the maintenance needs)



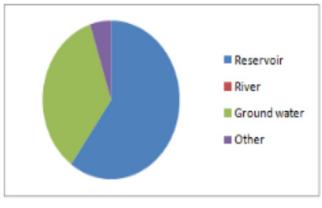
Response	Rpdent.	Percent.
Yes	16	80%
No	4	20%

If the answer is 'Yes', please specify the reason.

- I want more funds to control and further repair the dikes.
- I need more water for my cropping in order to raise my rice productivity.
- I want more water supplies.
- I want more water sources.
- I want to have more convenient roads.
- I want more canals connecting from the Tonle Sab to the commune.
- I want further O&M system.
- I want to have markets in my commune so that the price of my rice can be higher.

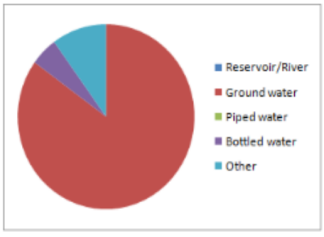
(B) Regarding the Physical Data and Information

2-1. What is the main source for agricultural water?



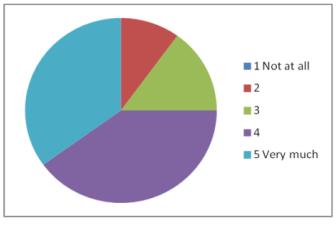
Response	Rpdent.	Percent.
Reservoir	12	60%
River	0	0%
Ground water	7	35%
Other(rain)	1	5%

2-2. What is the main source for drinking water?



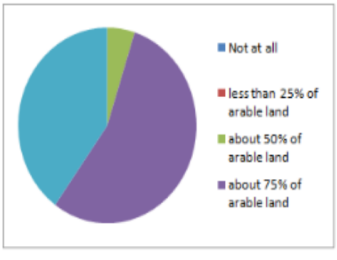
Response	Rpdent.	Percent.
Reservoir/River	0	0%
Ground water	17	85%
Piped water	0	0%
Bottled water	1	5%
Other(rain)	2	10%

2-3. Do you think flood damage in your village has been reduced since KOICA project had finished?



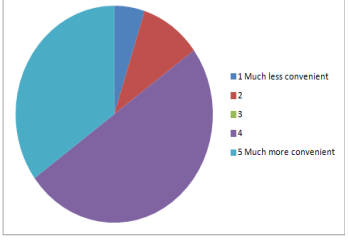
Response	Rpdent.	Percent.
1 Not at all	0	0%
2	2	10%
3	3	15%
4	8	40%
5 Very much	7	35%

2-4. How much agricultural land get benefit from KOICA flood control project?



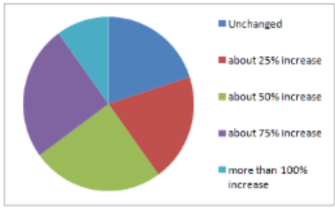
Response	Rpdent.	Percent.
Not at all	0	0%
Less than 25% of arable land	0	0%
About 50% of arable land	1	5%
About 75% of arable land	11	55%
100% of arable land	8	40%

2-5. Do you think it is more convenient for you to get agricultural water than before the project?



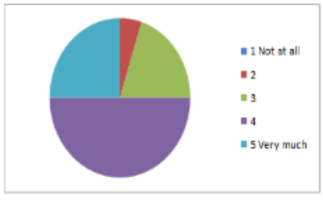
Response	Rpdent.	Percent.
1 Much less convenient	1	5%
2	2	10%
3	0	0%
4	10	50%
5 Much more convenient	7	35%

2-6. How much do you expect the increase of crop yield after the KOICA project?



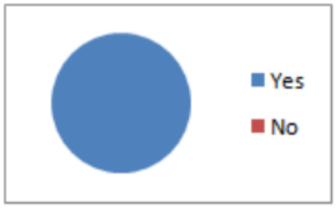
Response	Rpdent.	Percent.
Unchanged	4	20%
About 25% increase	4	20%
About 50% increase	5	25%
About 75% increase	5	25%
More than 100% increase	2	10%

2-7. Do you expect the increase of crop production could lead to the increase of rural household income?



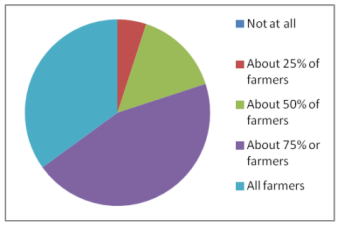
Response	Rpdent.	Percent.
1 Not at all	0	0%
2	1	5%
3	4	20%
4	10	50%
5 Very much	5	25%

2-8. Are there farmers who start multiple cropping after this project?



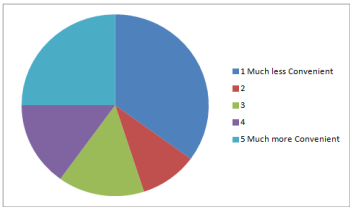
Response	Rpdent.	Percent.
Yes	20	100%
No	0	0%

2-9. Do you think how much farmers have practicing multiple cropping cultivation after the KOICA project?



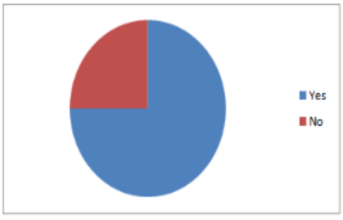
Response	Rpdent.	Percent.
Not at all	0	0%
About 25% of farmers	1	50%
About 50% of farmers	3	15%
About 75% of farmers	9	45%
All farmers	7	35%

2-10. Do you think it is more convenient to get drinking water than before the projects?



Response	Rpdent.	Percent.
1 Much less Convenient	7	35%
2	2	10%
3	3	15%
4	3	15%
5 Much more Convenient	5	25%

2-11. Is there any unexpected positive or negative impact derived from these projects?



Response	Rpdent.	Percent.
Yes	15	75%
No	5	25%

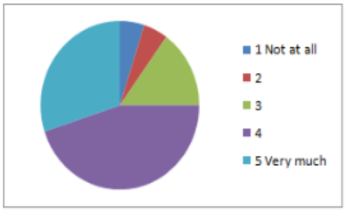
If the answer is 'Yes', please specify them below.

- Positive impacts:
  - o I can crop twice per year.
  - o I can do multiple cropping per year.
  - o I can have more productivity.
  - o There is more water supply than before.
  - o I have enough water for my cropping.
  - o I have sufficient water to raise my animals and water my crops.

- Negative impacts:
  - o I have less income.
  - o The dike is damaged, causing the flood.
  - o There is still flood in the lower areas inside the reservoir sometimes.
  - o There was violence over the targeted land for the projects.

(C) Contentment on the Performance of the Projects

3-1. How do you satisfied with the outcome of the projects?



Response	Rpdent.	Percent.
1 Not at all	1	5%
2	1	5%
3	3	15%
4	9	45%
5 Very much	6	30%

3-2. If you are not satisfied with the projects, what are the main deficiencies of the projects?

- There is no water left from November to December because the water is drained to the land outside the reservoir.
- Before I was very satisfied, but now the land inside the reservoir is flooded during the rainy season.
- There was violence over the targeted lands for the projects.
- There are a lot of damages to the dikes.
- There is still lack of "water pumping system".
- There is no proper operation and maintenance.
- There is violence over the water.
- There is no water control.
- FWUC members are corrupted, so the water sharing is unequal.
- I would like to have more proper maintenance.

3-2. If you have other opinions or suggestions about the whole project, please specify them below.

- I would like to request another canal bringing water from Tonle Sab.
- I would like to request from more water supplied/sources.
- There are so many dragon holes, and not many people use it anymore.
- Properly control the dikes.
- I request one canal from Prek Kdam.
- I would like to have one water pumping station to bring water.
- I want to have a commune market so that the price is stable and/or higher.

B) Answers of FWUC Members

(A) Information on the Respondent of the Questionnaire

1-1. I took part in the project from the earlier stage (2009) of this project as a representative of villages or a member of the FWUC Committee.

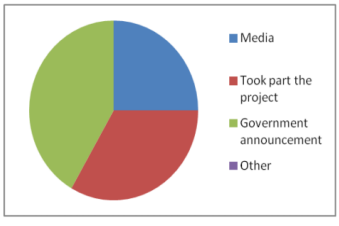
Response	Rpdent.	Percent.
Yes	10	100%
No	0	0%

(B) Regarding Awareness of the Irrigation System Construction Project

2-1. Do you know the fact that this project was assisted by the Korean Government?

Response	Rpdent.	Percent.
Yes	10	100%
No	0	0%

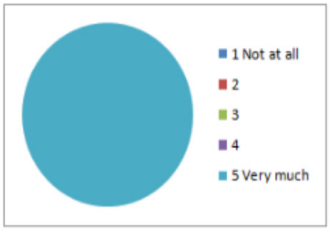
2-2. If your answer of question 2-1 is 'Yes', how did you know?



Response	Rpdent.	Percent.
Media	6	25%
Took part the project	8	33%
Government announcement	10	42%
Other	0	0%

(C) On Preparation and Implementation of the FWUC Program

3-1. Do you think this project(FWUC Formation and Operation) has reflected local residents' opinion and suggestions?

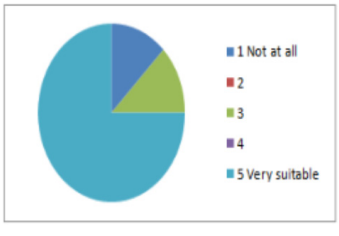


Response	Rpdent.	Percent.
1 Not at all	0	0%
2	0	0%
3	0	0%
4	0	0%
5 Very much	8	100%

3-2. If your answer of question 3-1 is in a negative scale, why do you think so?

Response	Rpdent.	Percent.
The experts and officials in charge did not ask what you wanted	2	34%
You could not communicate with the experts and officials well	1	16%
Though you let them your ideas, they did not accept them	1	16%
In the initial stage of the project, most of the villagers did not have their ideas or opinions, unfamiliar with the concrete and exact idea of FWUC	1	16%
Etc.	1	16%

3-3. In case you took part in this project from the initial stage, do you think the program for public relations and training was suitable in terms of getting relevant knowledge and know-how for your capacity development as a member of FWUC?

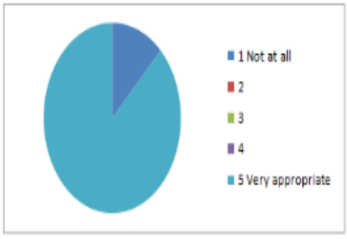


Response	Rpdent.	Percent.
1 Not at all	1	12.5%
2	0	0%
3	1	12.5%
4	0	0%
5 Very suitable	6	75%

3-4. If your answer of question 3-3 is in a negative scale, why do you think so?

Response	Rpdent.	Percent.
The length of the training program was too short	1	25%
The contents of the training program did not cover some of the required curricula	1	25%
The level of the training was under expectation, not reflecting the local conditions and the opinions of the villagers	1	25%
Etc. (not punctual)	1	25%

3-5. Do you think the design on the organization and operation of the FWUC was appropriate in terms of functioning, self-sufficiency and sustainability of the community?



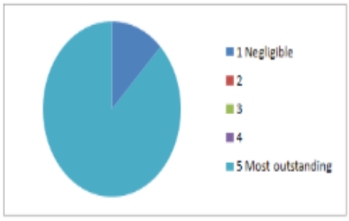
Response	Rpdent.	Percent.
1 Not at all	1	12.5%
2	0	0%
3	0	%
4	0	0%
5 Very appropriate	7	87.5%

3-6. If your answer of question 3-5 is in a negative scale, why do you think so? Please describe your opinion and give some suggestion for modification in the future.

(They had no any comments)

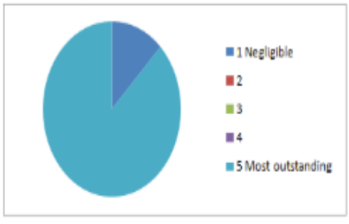
(D) On Performance of the Irrigation System Construction Project

4-1. (On FWUC formation and operation) What do you think of the outcome of the FWUC formation and operation?



Response	Rpdent.	Percent.
1 Negligible	1	12.5%
2	0	0%
3	0	%
4	0	0%
5 Most outstanding	7	87.5%

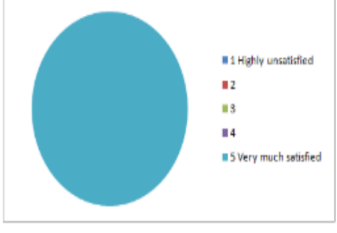
4-2. (On the construction and operation of irrigation facilities) What do you think of the outcome of the construction and operation of the irrigation facilities?



Response	Rpdent.	Percent.
1 Negligible	1	12.5%
2	0	0%
3	0	%
4	0	0%
5 Most outstanding	7	87.5%

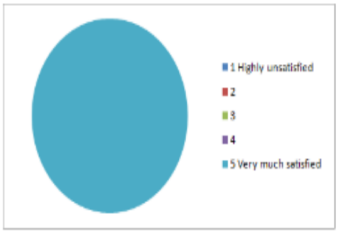
(E) Maintenance and Sustainability of the Project

5-1. (On FWUC system) Do you think the FWUC operational mechanism runs smooth as expected?



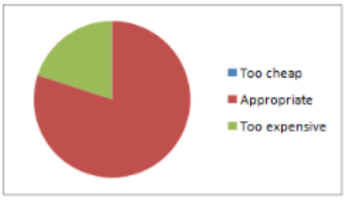
Response	Rpdent.	Percent.
1 Highly unsatisfied	0	0%
2	0	0%
3	0	%
4	0	0%
5 Very much satisfied	7	100%

5-2. (On FWUC system) Do you think the operation and management of the FWUC is sound in terms of financial and managerial capability?



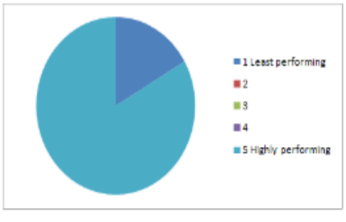
Response	Rpdent.	Percent.
1 Highly unsatisfied	0	0%
2	0	0%
3	0	%
4	0	0%
5 Very much satisfied	7	100%

5-3. (On FWUC system) Do you think the level of the Irrigation Service Fee(ISF) is appropriate in terms of the FWUC system management?



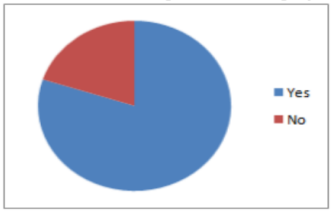
Response	Rpdent.	Percent.
Too cheap	0	0%
Appropriate	4	80%
Too expensive	1	20%

5-4. (On irrigation system and field facilities) Do you think the irrigation system and field facilities are under due operation and maintenance?



Response	Rpdent.	Percent.
1 Least performing	1	16%
2	0	0%
3	0	0%
4	0	0%
5 Highly performing	5	84%

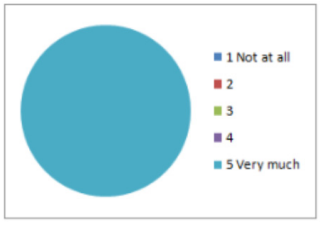
5-5. (On irrigation system and field facilities) Were there appropriate repair works of damage caused after the completion of the project?



Response	Rpdent.	Percent.
Yes	4	80%
No	1	20%

(F) Overall Contentment on project Performance

6-1. How do you satisfied with the overall outcome of the two consecutive projects: Flood Control and Irrigation System Construction?



Response	Rpdent.	Percent.
1 Not at all	0	0%
2	0	0%
3	0	0%
4	0	0%
5 Very much	9	100%

6-2. If you have other opinions or suggestions about the project, please specify them below.

(They had no any comments)

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