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# Ex-post Evaluation Report on the Project for Irrigation Technology Capacity Building in Upper Myanmar

2013. 12

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한국국제협력단



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**KOICA**  
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This evaluation study was entrusted to Yeungnam University by KOICA for the purpose of independent evaluation research. The views expressed in this report do not necessarily reflect KOICA's position.





## List of Abbreviations

Abbr.	Formal name
CAD	Computer-Aided Design
DB	Database
GIS	Geographical Information Systems
IT	Information Technology
ITC	Irrigation Technology Center
JICA	Japan International Cooperation Agency
KOICA	Korea International Cooperation Agency
MDG	Millennium Development Goals
OECD/DAC	Organization for Economic Cooperation and Development/ Development Assistance Committee
PDM	Project Design Matrix
PMC	Project Management Consulting
TOR	Terms of Reference

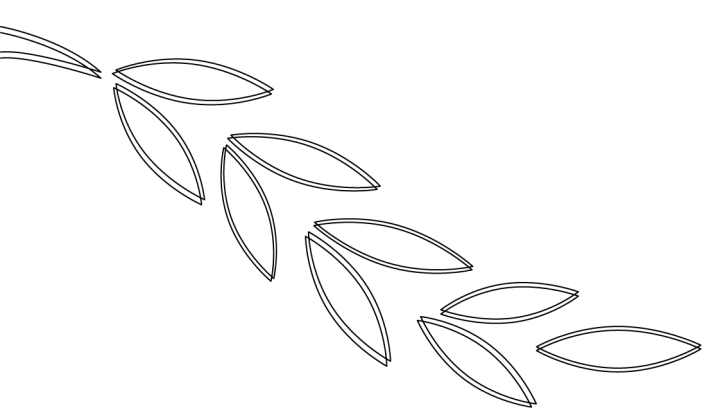


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## Summary





## Summary

As the agricultural industry forms a great part of the total industries in Myanmar, the nation has made efforts to improve its agricultural productivity. Particularly, they have heavily invested in expanding irrigation area by developing sources for farming water such as dams or pumping stations. In this process, testing and analysis of soil and materials are very important for designing and manufacturing irrigation facilities. This is the post-evaluation on the “Capacity Building for Irrigation Technology in Upper Myanmar” implemented by KOICA for the Irrigation Technology Center (ITC) in Patheingyi in charge of testing and analyzing soil and materials, and offering training for irrigation facilities which are necessary for expanding irrigation facilities. For this, the process and accomplishments of the project are analyzed based on the standards recommended by the OECD/DAC, including relevancy, efficiency, effectiveness, impacts and sustainability.

To collect evidence for the evaluation, literature search from the planning to completion stages of the project and interviews with people in charge of the project both in Korea and Myanmar, staff from the recipient organization in Myanmar and officials from the project-related governments were conducted. In addition, buildings and equipment provided to the recipient organization were also checked. The results of the comprehensive post-evaluation were drawn based on materials from the recipient organization, interviews and survey, and it is explained as follows.

### 1) Relevancy

Agriculture is one of major parts of KOICA’s grant-type aid to Myanmar, and they also put top priority on the 2011 support program on the environment improvement

for residents through increase in the farming productivity. Therefore, the project, one of the major factors to contribute to raising productivity, accords with KOICA's aid policy, and can also contribute to accomplishing the MDGs, such as reducing people under the extreme poverty in half. Myanmar has the Bago ITC in the southern part and Patheingyi ITC in the northern part, in charge of testing and analyzing to expand irrigation facilities. As of 2012, Bago had the largest of irrigation areas of around 370,000ha and Mandalay with the project had the second largest of about 340,000ha. The impact of the project for the Patheingyi ITC which supports the northern part with relatively low annual precipitation and high effect for the development of new sources of farming water appears quite bigger. If irrigation facilities make double-cropping a year possible, it can also have a great impact on the productivity of neighboring towns. Therefore, the selection of the site and organization for the project is considered relevant.

It was revealed that the PMC implementing the project has abundant construction experience but lacks professionalism in irrigation. Even though the project was conducted for the agency specializing in testing and analyzing soil and materials, the PMC lacks expertise in the field, so it was hard to have meetings to select and supply equipment, dispatch specialists and provide technical training. The composition of the project such as equipment support and technical training were organized relevantly to accomplish the original purposes, but its contents did not show high effectiveness and efficiency due to the lack of professionalism in its details.

## 2) Effectiveness and impact

The effectiveness was evaluated based on the outputs and outcomes. The output was considered relevant in the quantitative side but insufficient in the qualitative side. Some equipment for the testing and analysis could not function properly, some needed to be replaced due to broken parts and some were inappropriate for their purpose. When it came to the use of analyzers, preciseness and reproducibility are significant but the equipment did not satisfy them. Some devices such as a triaxial compression tester showed problems, and training for its use was not offered sufficiently; thus, the device was not able to be used for the testing and analysis. According to the results of the short- and mid-term effectiveness which were achieved and achievable from the performance of the project, the testing building, equipment for testing and analyzing soil and materials and training for soil were partly good. It is considered that the training for soil contributed to supporting the testing and analysis necessary for building dams under construction in connection with the testing and analysis of soil and materials. Devices except the triaxial compression tester which is important for the testing and analysis of soil but difficult to be used were being continuously in use even during the post-evaluation period. The tests and analysis of soil and materials necessary for designing and constructing irrigation facilities in the northern area will be continued.

When it comes to the analysis of impact, several items were investigated, including the use of the result of the project in the irrigation facilities, development of farming water and improvement of irrigation facilities in places governed by the ITC, and increase in agricultural productivity by expanding irrigation areas. Above all, as mentioned in the analysis of the results, there have been continuous demands for testing and analysis by using the equipment. According to the unexpected results during the visits to the ITC, the Mandalay Technological University was using the trial analyzers in the ITC for the educational and research purposes. In the engineering college of Mandalay lacking testing analyzers, professors and students visited the ITC

to conduct their studies by using the high-tech equipment. In addition, the ITC also supported the testing and analysis for soil and materials to construct multipurpose dams. The device was originally provided for the testing and analysis of the irrigation area, but the use influenced universities or other departments.

### 3) Efficiency

The efficiency of the project was evaluated based on working expenses, man power, the testing building, equipment and educational training. The working expense was appropriate by considering the scale and nature of the project, and when it came to manpower, the personnel of each part was also relevant except for the dispatch of experts for the construction. Taking the nature of the project into consideration, it is desirable to put bigger importance on training for testing devices or the design and computerization of irrigation facilities—not on the dispatch of specialists for the construction. There were two major problems for supplying the devices: first, the triaxial compression tester with poor-quality specifications lowered the reliability of the testing results, and second, supply of this kind of device made the educational training difficult. During the field investigation for the post-evaluation, the staff of the ITC asked for the replacement of parts for the normal operation of the equipment and additional training to have the better skills for the device. Therefore, the efficiency of the project on the testing building and equipment appears to be low. Educational training by specialists on the design of irrigation and GIS/DB was appropriate quantitatively but its quality was quite low because the training for just basic CAD and GIS/DB was not enough to strengthen the capacity to achieve the original purpose of the project. As mentioned earlier, it is bad for irrigation specialists not to consider details or practical capabilities of trainees to design and plan the irrigation facilities nor reflect it to their computation education. This kind of education can be more efficient by dispatching experts of each field in partnership with Korean organizations similar to the ITC.

#### 4) Sustainability

The ITC established before the start of the project conducted testing and analysis and provided training for government officials involved in the irrigation sector. The ITC continues to implement the roles even after the project, which was revealed from the materials from the ITC and also showed the change in their performances from the past to the present. The management strategies of the recipient country and organization were mostly appropriate, and they have kept its function. The Myanmar government has greatly increased investment in the ITC since 2009, which includes all expenses for personnel and work of the ITC. Therefore, the follow-up measures for the ITC taken by the recipient country have been very positive. Considering the fixed number of employees in the ITC, it is easy to recognize that the Myanmar government has continuously invested and made actions to have the ITC play its role properly. The most important factor for the sustainability is ownership of staff of the department of irrigation of the Ministry of Agriculture and Irrigation (MOAI) and ITC. According to the survey, the result of the project was evaluated positively. In addition, the central government continues to increase investment and the role of ITC will be strengthened.

The follow-up measures and proposals of the project from the evaluation process are as follows.

##### (1) Support for the maintenance of the equipment for the testing and analysis

There were problems that some devices were not run properly due to breakdown or dysfunction of some parts. If there are problems related to the replacement or repair of some parts which are hard to be secured in the recipient country, there should be follow-up actions. In addition, for equipment that requires reagents or consumables, it should be checked that whether or not these are available in the recipient country, and if not, there should be



support for this. Likewise, follow-up actions should be taken to get the equipment properly used. Moreover, some devices need follow-up measures including providing manuals and specifications, education for maintenance and calibration and supply of extra devices to check water quality.

## (2) Technical extension services

Education was provided by the dispatched experts on how to use the equipment. Even though the devices had different usages depending on the purpose and method of the testing and analysis, education for both the testing method and the use of the equipment was not offered properly. Therefore, it is necessary to improve reliability by reviewing the testing and analysis through the use of the equipment and its results to strengthen the capacity of the ITC for testing and analysis.

## (3) Connection with related testing organizations in Korea and dispatch of experts

It was evaluated that the effectiveness of the training program through the project did not appear that high. The program for the technical capacity building had limitations to be applied in the site due to restricted period of dispatch of the experts and offer of only basic educational contents. As one of follow-up actions, it is desirable to dispatch experts with revised educational programs in connection with Korean research institutes in charge of work similar to ITC. When the evaluation team visited ITC, the roles of KOICA volunteers and experts were very encouraging. They can be an extended part of the project, and raise sustainability because equipment and consumables can be supported quickly and some insufficient parts of the project can be supplemented easily. If more specialists with experiences on the testing and analysis of soil and materials are sent there, it can increase success of the project.

Lessons which should be considered for capacity building projects for the specialized organization like ITC are as follows.

#### (1) Connection with specialized Korean organizations related to the sector

It is necessary to have experts with abundant experiences and related organizations in Korea participate in technical capacity building programs like the project targeting the specialized area. In addition, it is also desirable to implement the project in cooperation with related organizations from the planning to implementation process. Organizations or research institutes involved in similar functions and roles understand and know the importance and necessity of their work each other. It is good to include related organizations in Korea in the implementation of the project; otherwise there should be advice during the implementation of the project and support for the actual exchange of information. The effectiveness of the project can be raised by reviewing specification of the equipment in the process of selecting the devices and maximize by having experts participate in offering training programs. In the long term, it can be expected to exchange human resources and technologies, so it should have a great impact.

#### (2) Selection and supply of equipment

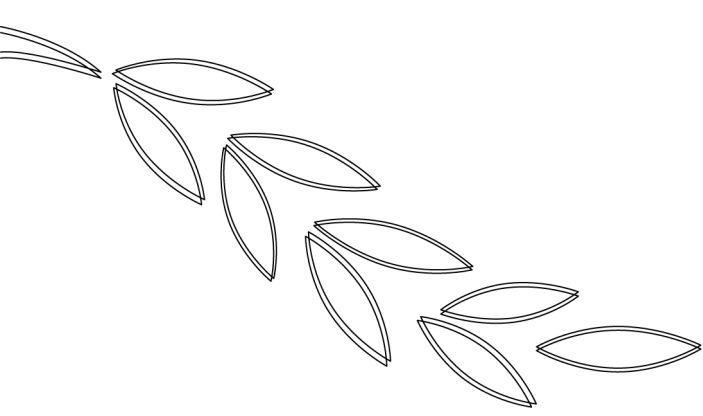
124 kinds of devices for testing and analysis including universal equipment were provided for the project, which seemed to be generally appropriate in terms of type and quantity. However, some costly equipment appeared to be inappropriate for the purpose and use of the testing and analysis, so they should be checked by experts whether their specifications are proper for the test. As the equipment was selected and purchased based on the result report and the implementation plan of the project before the selection of the implementing organization of the project and ordered by KOICA, if there is

any advice on the specifications of the devices in the future, the equipment can be provided more effectively. It is also necessary to have experts or qualified personnel check the equipment, even if the devices have been purchased and provided by the PMC.

### (3) Dispatch of KOICA experts and volunteers

After the completion of the project, the dispatch of volunteers and experts in civil engineering to the ITC was evaluated very positive. The recipient organization considered this as expanded measures of the project, and they were positive about education on how to use the equipment and computer applicable to the site. Devices for testing and analysis are various and some need to have qualified experts, so the long-term based dispatch of specialists of each area can raise effectiveness and sustainability of the project.

Relevance	Effectiveness/Impact	Efficiency	Efficiency	Result
<p>-Adequate for development goals and strategies of the recipient country.</p> <p>-Several irrigation projects in sites governed by ITC are under progress and the ITC keeps performing testing and analysis and results necessary in the sites.</p>	<p>-Accomplishment of the construction of the testing building and offer of equipment and training by specialists as originally planned.</p> <p>-Continuous testing and analysis by using the provided equipment.</p> <p>-Despite some problems on some devices, it was used at the Mandalay Technological University for research.</p>	<p>-Officials in the ITC and MOAI evaluated the project quite successful.</p> <p>-However, more efficient training through the equipment and dispatch of experts was not provided due to lack of professionalism of the PMC.</p>	<p>-After the project, the ITC increased investment continuously.</p> <p>-Testing and analysis necessary for the site for the construction of a dam have been conducted continuously.</p>	Successful
3	2	1	3	9



# I . Overview

1. Background and Objectives
2. Project Overview
3. Evaluation Criteria and Items
4. Methodologies





## 1. Background and Objectives

As of 2012, around 70% of the total population of Myanmar (approximately 60 million total) lives in rural areas, and 33% of the GDP is agricultural products including forestry and fishery. About 28% of the export is from farming products, which is a large portion of the national industry. As of 2012, the acreage is around 12 million ha—smaller than those of Thailand and Indonesia, but bigger than Bangladesh, Cambodia and Vietnam. The Myanmar government plans to develop hollow land of 230,000ha and uncultivated land of 5.7 million ha to increase agricultural productivity. They have reclaimed more land to expand acreage, constructed banks to prevent flooding and introduced terrace farming to prevent soil erosion. In addition, they have also improved drainage and irrigation, and expanded farm land to increase farming productivity. Around 8,150,000ha of land under cultivation is being used by peasants and their average acreage is approximately 2.4ha. Big-sized farming companies and the government affiliated organizations have around 1,380,000ha farmland.

The amount of water resources in Myanmar is around  $1 \times 10^{12}$  tons and only 68% is being used. To increase supply of irrigation water, they have come up with various methods including construction of new banks, water management at the basin unit, maintenance of existing dams, and use of river and underground water. Particularly, they have heavily invested in the construction of new dams since 1988, and they had only around 540,000ha irrigation land before 1988, but it has continued increasing. Considering the change in the area of irrigation farmland, it was just

around 1,000,000ha in the early 1990s but doubled to about 2,200,000 ha in 2010. As of 2013, seven new dams are under construction. When it comes to the implementation of the policy to expand irrigation farmland, it is essential to build various irrigation facilities such as a new dam or a reservoir.

For the construction of irrigation facilities such as a dam, it is necessary to test and analyze a variety of soil and materials, and the results are important to manage the quality of each stage in the process of design and construction. In Myanmar, the ITC is in charge of testing and analysis, and MOAI runs two Bago and Patheingyi ITCs in the southern and northern parts respectively. The Bago ITC has introduced and secured equipment necessary for testing and analysis through the two-phase project (first from 1988 to 1999 and second from 1999 to 2005) and also raised working abilities through the long-term based dispatch of experts from JICA. However, Patheingyi ITC has had hard time in implementing the construction of dams in the northern part due to lack of equipment for testing and analysis, and worn-out devices in use. Accordingly, the Myanmar government asked for the technology capacity building project such as modernization of equipment for testing and analysis, and computerization of testing and analysis, and the design of irrigation facilities, which was implemented by KOICA from 2008 to 2010.

This evaluation was conducted for the post-evaluation for the irrigation technology capacity building of Upper Myanmar targeting the Patheingyi ITC. This is to measure the sustainability, impacts and effectiveness of the project, and give proposals or strategic lessons for related projects. The matrix for the performance evaluation and process evaluation was drawn by considering all characteristics of the project, related documents from the planning to completion of the project were collected and interviews with related people both from Korea and Myanmar. Also, a field investigation was conducted by the recipient organization. This evaluation purports to give proposals for the follow-up measures for providing lessons and improving sustainability which should be considered in the process of planning and

implementation of projects whose main goals are to offer equipment for trial research or enhance technology capability.



## **2. Project Overview**

### 1) Patheingyi Irrigation Technology Center (ITC)

The Patheingyi ITC is a testing and analysis institute belonging to the Investigation Branch of the Irrigation Department under the Ministry of Agriculture and Irrigation (MOAI). It was first established in Myittha Township in Mandalay in 1991 when Sedawgyi and Kinda dams were completed. The first Patheingyi ITC conducted testing and analysis of soil and construction materials necessary for the irrigation project and contributed to the quality management. In 1995, the ITC came to belong to the Planning and Design Branch, moved to the current Patheingyi Township and became in charge of training programs for irrigation facilities in addition to its original responsibility of testing and analysis of soil and materials. Finally, it obtained its official name of ITC. The Patheingyi ITC has six divisions of testing and analysis, quality control, central management, educational training, administrative affairs, drawings and specification, and accounting.

### 2) Outline

The evaluation was conducted to increase capabilities for irrigation facilities through offer of equipment for the testing and analysis for soil and materials, education for the use of the equipment, and training for the computer technology for Patheingyi ITC. Originally, there was income generation in farm houses in the planning of the project by expanding the irrigation area as one of the goals as well as direct and indirect long-term expectations. To achieve the goals and expectations, the details of



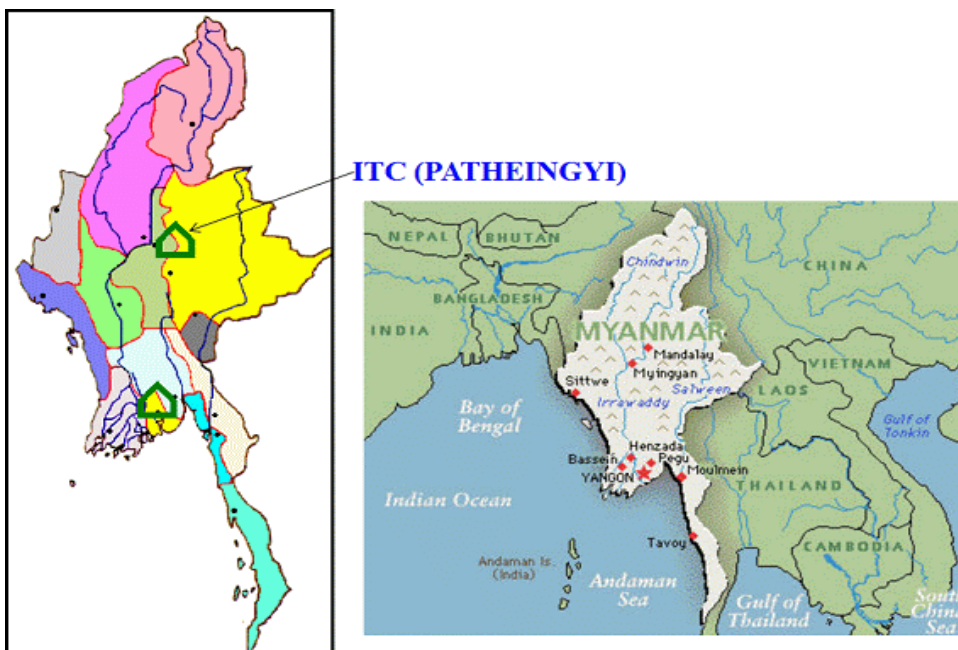
the project included the construction of the laboratory building, support for the equipment for testing and analysis, education for its application, dispatch of experts for irrigation technique education and an international training program in Korea. The experts to offer the training programs include several fields such as irrigation technologies, construction, equipment and IT (specifically, the IT field is about the design of irrigation, soil, GIS and DB), which is related to the plan on the irrigation facilities of the ITC.

The project outline created in the planning process is explained in Table 1. As explained in the table, the project is to strengthen the capacity for testing and analysis and improve the design capacity for the ITC in charge of testing and analysis of soil, and training of irrigation techniques. Therefore, it is necessary for the project to have professionalism to plan and design dams or pumping stations to operate testing and analysis technique-related devices and expand irrigation facilities as well as the works that are related to civil engineering and construction, different from other development cooperation-based projects, so it can expect impacts in related fields in the recipient country.

<Table 1> Overview of “Capacity Building for Irrigation Technology in Upper Myanmar”

Classification	Explanation	
Objectives	To build a laboratory to design and construct dams and irrigation facilities, and offer equipment and training programs about the use of equipment and computer technology to strengthen irrigation skills.	
Project details	Construction of laboratory	Testing building 1,700m2 Laboratory and computer education room
	Equipment	For testing and analysis of soil and materials such as concrete Computer and data processing-related devices Vehicle
	Dispatch of experts	1 for management for 7 months 1 for construction for 3 months 1 for equipment training for 4 months

		3 for IT (irrigation design, soil, DB and GIS) for 7 months
	International training program in Korea	10 people for the Manager Course (10 days) 15 staff from the Irrigation Department for 3 weeks
Site	Patheingyi ITC in Mandalay, Myanmar	
Expectations	<ul style="list-style-type: none"> <li>Contribute to the agricultural development through the expansion of the irrigation area and income generation in farm houses.</li> <li>Enhance technical capabilities necessary for the operation of the irrigation center through technology transfer including testing of latest construction materials, quality control and data-processing ability.</li> </ul>	
Period	2008-2010	
Total working expenses	USD 2,000,000 (actually executed amount: USD 1,670,000)	
Implementing organizations	Korea	KOICA, Hudigm, DainRevo-Tech
	Myanmar	Ministry of Agriculture and Irrigation



<Picture 1. Project Location>



### 3. Evaluation Criteria and Items

The relevance, efficiency, effectiveness, impact and sustainability of the project were evaluated based on the OECD/DAC evaluation criteria.

<Table 2> Evaluation Criteria-Based Items and Methods

Classification	Criteria	Items	Methods
Process evaluation	Relevance	<ul style="list-style-type: none"> <li>· Accord with the agriculture-first policy of the recipient country?</li> <li>· The site for the project relevant?</li> <li>· Prepared with elements for the project properly?</li> <li>· Goals and plan appropriate?</li> </ul>	Literature search, interviews with people in charge of the project and related materials.
	Efficiency	<ul style="list-style-type: none"> <li>· Inputs composed properly?</li> <li>· Mechanism of the project management operated properly?</li> <li>· Problem-solving structure in case of unexpected occasions?</li> </ul>	Literature search, interviews with people in charge of the project and related materials.
	Sustainability	<ul style="list-style-type: none"> <li>· Exit strategies and relevance?</li> <li>· Post-management and follow-up measures appropriate?</li> <li>· The project give the beneficiaries the proper ownership?</li> <li>· Follow-up measures and plans?</li> </ul>	Literature search, interviews with people in charge of the project and related materials.
	Others	<ul style="list-style-type: none"> <li>· Matters able to influence the environment in the process of the project implementation?</li> </ul>	Interviews with people in charge of the project and related materials.
Performance evaluation	Effectiveness	Output <ul style="list-style-type: none"> <li>· The testing building designed and constructed suitable for its purpose?</li> <li>· The capability of irrigation technologies strengthened through training programs?</li> </ul>	Literature search, interviews with people in charge of the project and related materials.

		Outcome	<ul style="list-style-type: none"> <li>· Work ability improved through technical training?</li> <li>· Demands for the testing building and equipment continued?</li> </ul>	Literature search, interviews with people in charge of the project and related materials.
	Impact		<ul style="list-style-type: none"> <li>· The equipment and education training used well for the expansion of irrigation facilities in the upper part?</li> <li>· Expansion of irrigation area increase the farming productivity?</li> </ul>	Interviews with people in charge of the project and related materials.



#### 4. Methodologies

##### 1) Literature search

This evaluation reviewed the result reports on the field investigation and the project discussion for the project planning stage; the project executive plan, quarterly reports, final report and result report on the mid-evaluation in the stage of the project implementation; and the result report on the final evaluation in the stage of the completion of the project in Korea. The 2012 report on the overall condition of agriculture published in English by the MOAI and the summary of the project by the department of irrigation were also examined. Moreover, materials regarding the implementation projects and activities from the completion of the project to early 2013 were also checked.

## 2) Interview with project-related stakeholders both in Korea and Myanmar

There were interviews with related people from the government of Myanmar, the Korean organization for project implementation and the construction company of the testing building. An interview with the manager of the organization for project implementation was not conducted due to the retirement of the manager; however, information about the process of the project was provided from an interview with the presidents of the company offering the equipment. According to the interviews with the director of the project during the process as well as the current director and deputy director of the KOICA headquarters, comprehensive opinions on the project were collected. In Myanmar, data was collected from interviews with the staff on the Irrigation Department of the MOAI, the director and employees of the ITC and staff completing the training. In addition, according to the interview with the president of the company in Myanmar in charge of the construction of the testing building, opinions and materials about the whole process of the project were collected.

## 3) Project site visit and interviews

The team visited the Patheingyi ITC for the evaluation, checked equipment for testing and analysis furnished in the testing building and laboratories, and interviewed staff in ITC. During the visit to ITC, there were presentations on the performance and effectiveness of the project by the director, and a Q&A session to acquire information. The interviews with the staff were conducted with extra questions and answers, and visits to each laboratory helped collect actual and concrete opinions. In addition, through the interviews with KOICA volunteers and experts dispatched to the ITC as well as KOICA experts sent to the Mandalay Technological University, more information related to sustainability was collected,



Seminar and interviews at the Patheingyi ITC



Interviews with volunteers dispatched to the Patheingyi ITC



Check of equipment in the Patheingyi ITC



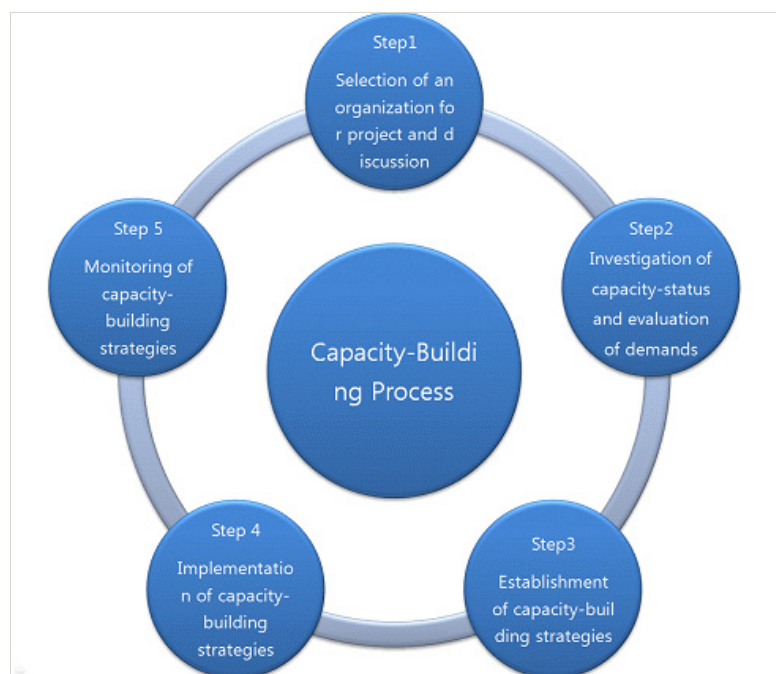
Interviews with officials from the Irrigation Department in Naypyidaw

<Picture 2. Interview and Investigation Activities During Visit>

#### 4) Review of methodologies for the capacity evaluation

##### A. Methodology of the UNDP

According to the methodology for the capacity evaluation of the UNDP (2007), capacity is defined as the individuals, organizations or society that can perform its functions, solve problems and set a goal in a sustainable way. Therefore, capacity building or capacity developing is maintained, settled and strengthened as time goes by. The capacity evaluation is to assess the current capacity to prepare for the future. In this process, the needs for the current assets and the requirements for the capacity development are understood, and based on this, the capacity building strategies are established. The process of capacity building proposed by UNDP is described in Picture 3 below



<Picture 3. Process of the UNDP's capacity building>

The strategies for capacity building are compromised of: 1) the improvement and encouragement of organizations and institutes, 2) capability for the instruction, 3) education, training and learning and 4) reliability and communication structure.

## B. Application of methodologies of the capacity evaluation

The project is to strengthen capabilities of ITC mainly in charge of testing and analysis of soil and materials in agriculture and civil engineering fields based on the demand of the recipient country. In Picture 3, step 2 and 3 are the stage of the project plan, step 4 is the implementation, and step 5 is post-evaluation and continuous monitoring. In the post-evaluation, step 2 and 3 should have been conducted more appropriately to apply the evaluation method of the UNDP; however, it was not. Therefore, the evaluation was performed indirectly based on the data from the ITC.

It is evaluated that the inputs and activities of the project did not have an impact on the improvement, support, reliability and communication system for the ITC structure itself. The project can only expect the effectiveness of the hardware of the ITC by having a positive impact on the general structure of the ITC and building capacity through inputs of the testing building and equipment. This evaluation can be the important process as one of the monitoring strategies belonging to the step 5 of the capacity evaluation process of the UNDP. Based on the evaluation results, the follow-up actions for the project should be created and reflect the measures be proposed to draw more effective and efficient accomplishments from similar programs.



## 5) Limitations and complementary matters

### A. Restriction on the interviewees

It was impossible to have an interview with the project manager and staff of the implementing organization of the project because they were no longer employed at the organization. Therefore, it was difficult to investigate the issues or more details of the implementing organization, and thus the matters related to the training were not verified. When it came to some portions of the training, it was difficult to examine them elaborately because the evaluation was only based on the materials of several reports.

### B. Revising the plan of the Project Design Matrix (PDM)

It was revealed that the PDM created at the beginning of the project needed to be revised and partially supplemented. The first PDM (hereinafter, matrix) had two types; the first matrix was included in the pre-investigation made in December 2007 and the second matrix was included in the implementation plan created in July 2008. The second matrix seemed to have characteristics of the project, but both did not fully understand the objectives and range of the project. The matrixes are compared in Table 3 below.

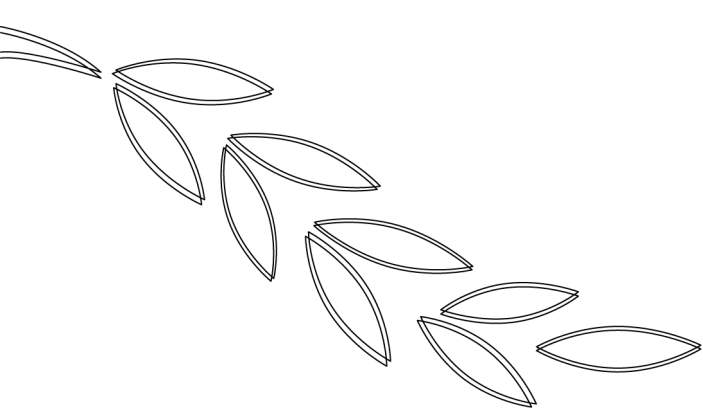
<Table 3> Review of the PDM created in the process of the establishment of the project plan and its amendment

Classification	PDM of pre-investigation report	PDM of the implementation plan	Amendment
Beneficiaries	1st:Government officials and farming leader in Patheingyi 2nd:Farmers in Patheingyi,	Patheingyi residents,	Technical personnel in the Patheingyi ITC and staff in charge of the irrigation project,
Original or ultimate goals	Increase in income for farmers by expanding irrigation area and raising productivity, and improvement of research capability on farming by operating the soil laboratory,	Development of agriculture by expanding the irrigation area and increasing income for farmers and enhancement of technical capacity of the experiment of construction materials, quality control and data processing,	Reinforcement of the project plan on irrigation facilities and quality control by strengthening capability of test/analysis of the Patheingyi ITC,
Evaluation index for the original goals	1. Change in income of residents and farming productivity, 2. Research capability of the soil laboratory (00% compared with Korea ),	1. Change in irrigation area before and after the establishment of the ITC, 2. Propagation of the project to neighboring towns,	1. Increase in items with test/analysis and reliability of the results of the test/analysis, 2. Abilities of the plan, design and management of the irrigation facilities by using a computer,
Project goals	1. Expansion of farming productivity. 2. Expansion of the irrigation area. 3. Enhancement of irrigation capabilities such as the operation of the soil laboratory.	1. Expansion of the irrigation area in upper Myanmar. 2. Increase in income of neighboring towns by expanding and improving the irrigation area. 3. Collection of information for investment in irrigation facilities in Myanmar.	1. Abilities of systematic and reliable testing and analysis for the quality control of construction in the process of establishment of irrigation facilities. 2. Abilities of design and plan of irrigation facilities by using CAD and GIS.

Classification	PDM of pre-investigation report	PDM of the implementation plan	Amendment
Index for the project goals	<ol style="list-style-type: none"> <li>Whether or not to expand the irrigation area in the project site.</li> <li>Change in farming productivity.</li> <li>Whether or not to apply new irrigation technologies.</li> </ol>	<ol style="list-style-type: none"> <li>Whether or not to expand irrigation area in the project site.</li> <li>Increase rate of farming productivity for residents.</li> <li>Expansion of irrigation areas through capacity building of new or improved irrigation techniques.</li> </ol>	<ol style="list-style-type: none"> <li>Whether or not to increase items for testing and analysis of soil and materials.</li> <li>Time and reproducibility required for the core testing and analysis.</li> <li>Capability of the design of irrigation facilities by using CAD.</li> <li>Capability of the plan on the design of irrigation facilities such as sluice analysis by using GIS.</li> </ol>
Outputs	<ol style="list-style-type: none"> <li>Construction of the testing building.</li> <li>Support for equipment for the experiment.</li> <li>Dispatch of experts.</li> <li>Training of the manager and staff of the project.</li> </ol>	<ol style="list-style-type: none"> <li>Construction of the testing building.</li> <li>Support for equipment for the experiment.</li> <li>Dispatch of experts.</li> <li>Training of the manager and staff of the project.</li> </ol>	<ol style="list-style-type: none"> <li>Testing building with the efficient testing work.</li> <li>Equipment for the experiment able to make the testing and analysis high reliability.</li> <li>Personnel with abilities to operate equipment and interpret the analysis results.</li> <li>Personnel with abilities to design irrigation facilities and use GIS/DB.</li> </ol>
Activities	<ol style="list-style-type: none"> <li>Contract with the PMC, construction, post-management, dispatch of experts and mid-evaluation.</li> <li>Purchase of</li> </ol>	<ol style="list-style-type: none"> <li>Contract with the PMC, construction, post-management, dispatch of experts and mid-evaluation.</li> <li>Purchase of equipment, examination,</li> </ol>	<ol style="list-style-type: none"> <li>Construction of the testing building reflecting the characteristics of testing and analysis, and demands of the ITC.</li> <li>Selection and offer</li> </ol>

Classification	PDM of pre-investigation report	PDM of the implementation plan	Amendment
	<p>equipment, examination, transportation and installment.</p> <p>3. Others: post-investigation of conditions of the project site, discussion on the project and project evaluation.</p>	<p>transportation and installment.</p> <p>3. Others: post-investigation of conditions of the project site, discussion on the project and project evaluation.</p>	<p>of equipment to improve the work of test/analysis.</p> <p>3. Educational training to improve the use of equipment for testing/analysis and ability to interpret its results.</p> <p>4. Educational training for the use of computer and GIS/DB software to plan and design irrigation through the dispatch of experts.</p>





## II . Evaluation Framework

1. Evaluation Framework Considering the Characteristics of the Project
2. Performance Model and Performance Evaluation Matrix
3. Process Evaluation Matrix





## II

# Evaluation Framework



### **1. Evaluation Framework Considering the Characteristics of the Project**

The project is limited to the ITC, and the training is provided only for the ITC staff. Thus, a deeper understanding of the functions and roles of related specialized areas and the ITC is required. It is significant to understand the works implemented by the ITC as well as the correlation and effectiveness of the offer of equipment and related training.



### **2. Performance Model and Performance Evaluation Matrix**

The performance evaluation is to assess all results from the inputs of the project, which consists of the evaluation of the outputs, outcomes and impacts. It can include both positive and negative results, and the outputs and outcomes can be evaluated together through the effectiveness of the project. The inputs, activities, outputs, outcomes and impacts of the project are described in Table 4 below.



<Table 4> Details of the Performance Evaluation

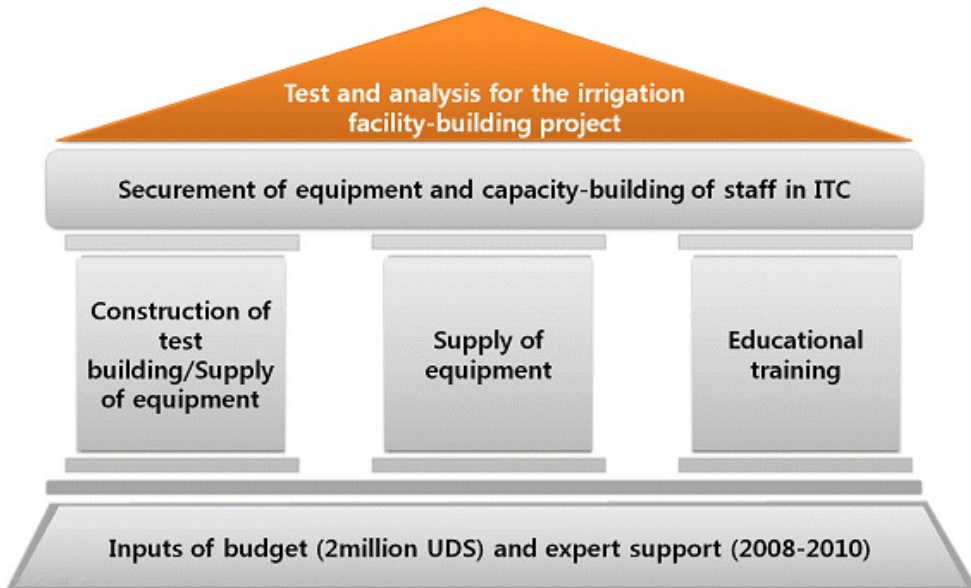
Category	Contents
Inputs	<ol style="list-style-type: none"> <li>1) Construction of the testing building               <ul style="list-style-type: none"> <li>- Laboratory for materials and soil</li> <li>- Computer education room</li> </ul> </li> <li>2) Equipment for experiment</li> </ol>
Activities	<ol style="list-style-type: none"> <li>1) Dispatch of experts</li> <li>2) Invitation of trainees to offer training programs</li> </ol>
Outputs	<ol style="list-style-type: none"> <li>1) Testing building</li> <li>2) Personnel operating the equipment for experiment of materials and soil</li> <li>3) Personnel designing the soil DB and GIS, and operating irrigation</li> </ol>
Outcomes	<ol style="list-style-type: none"> <li>1) Use of the testing building for the design of irrigation and related work</li> <li>2) Implementation of experiment for materials and soil to design irrigation and related work</li> <li>3) Establishment of the development and use of agricultural water, and implementation of the work for the basic design</li> </ol>
Impacts	<ol style="list-style-type: none"> <li>1) Contribution to the expansion of irrigation facilities by improving the capacity of testing and analysis of soil and materials, and the design of irrigation.</li> <li>2) Contribution to the development of agricultural water and improvement of irrigation conditions in upper Myanmar.</li> <li>3) Contribution to increase in farming productivity by raising irrigation land.</li> </ol>

The expectations of the project were to: 1) contribute to the development agriculture by generating more income through the expansion of the irrigation area and 2) improve technical abilities for the operation of the Irrigation Technology Center through introduction of new technologies including testing of latest construction materials, quality control and data processing capabilities. Moreover, the result report was revised to add the improvement of the implementation capability of the project, realization of security and quality control and the development of the

independent capacity of Myanmar. These were achieved by contributing to agricultural development through the construction of several dams, procurement of water sources and expansion of the irrigation area for the economic expectations and enhancing the testing capabilities of construction materials, quality control and data processing through introduction of technologies for dams, irrigation and IT for the technical expectations.

The results of the project are the improvement of work abilities through the offer and use of equipment for testing and analysis, design and plan of irrigation facilities and computer education. Supply of new devices or replacement of worn-out equipment made testing and analysis works possible, which was impossible before in ITC. Moreover, training of techniques about the design by using a computer and the plan on irrigation facilities by applying a digital map and GIS can be considered results as well because they can make a contribution to the expansion of the irrigation area in the recipient country, which is described in Picture 4 below.

**Contribution to expanding irrigation area and improving farming productivity in upper Myanmar**



<Picture 4. Performance Model of "Capacity Building for Irrigation Technology in Upper Myanmar">

Considering the outputs, outcomes and impacts of the details and characteristics of the project, the performance evaluation matrix is explained in Table 5 below. The establishment of related infrastructure for the construction of dams or expansion of the irrigation area depends on the policies of the MOAI of Myanmar, but it is still possible to expect to increase farming productivity. Therefore, the evaluation regarding the impacts implied that the expansion of the irrigation facilities can be continued.

<Table 5> Performance Evaluation Matrix>

Classification	Index	Confirmation method	Considerations
Outputs	1. Quality of the constructed testing building.	Project report	Completion of the project based on the project plan.
	2. Technical extension service by using the equipment.		
	3. Quality and performance of training programs.	Mid- and final-evaluation report	Proper support of the recipient country for the project.
	4. Acquisition of technologies through the technical extension service.	Survey Interview	Personnel's participation in the technical extension service with interest.
	5. Application ability of the software provided.		
	6. Number of personnel participating in the training program.		
Outcomes	1. Application in the field in the recipient country through training or technical extension service.	Project report	Proper offer of the technical extension service based on the project plan.
	2. Proper use of the testing building and equipment for the project and work related to the design of irrigation facilities.	Mid- and final-evaluation report	Proper offer and use of the testing building and equipment.
	3. Examples applied in the fields through the training program for the project.	Survey Interview	Continuous efforts to expand irrigation area in the recipient country.
Impacts	1. Use of output and outcome of the project in the design of the irrigation facilities and related work.	Project report	Connection of the improvement of the condition of water supply with expansion of the irrigation area and farming productivity in the recipient country.
	2. Continuous testing and analysis by using the equipment.	Mid- and final-evaluation report	
		Survey Interview	

	3. Smooth progress of the construction of dams and irrigation facilities through support for the testing and analysis.		Continuous implementation of policies related to agriculture and irrigation area in the recipient country.
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### **3. Process Evaluation Matrix**

In the process evaluation, it is evaluated that the project was performed properly from the planning to the implementation stages and various inputs were efficiently organized. Furthermore, even after the completion of the project, the original objectives can be accomplished based on its sustainability. Relevance of the project evaluates: 1) top priority of the government, 2) local or sector-based policies, 3) components of the project and 4) others, in terms of efficiency, 1) inputs and 2) mechanisms, sustainability, 1) management strategies and 2) will and capacity building of stakeholders in the recipient country, and the issue related to the impact on the environment is also assessed. The process evaluation matrix is described in Table 6 below.

<Table 6> Process Evaluation Matrix

Classification	Items	Questions	Materials	Confirmation tools and analysis methods
Relevance				
Priorities at the government level	1. Accordance with priorities in Myanmar	Do the goals, plans and implementation process of the project accord with the priorities, strategies and policy directions of Myanmar?	Support status to Myanmar, the rate of aid budget and its progress, and policy and strategic documents.	<ul style="list-style-type: none"> <li>· Review of the plan on grant-type aid.</li> <li>· Review of KOICA's support strategies of grant-type aid to Myanmar.</li> <li>· Review of policies and plans related to Myanmar.</li> <li>· Use of KOICA's statistical data on the grant-type aid.</li> </ul>
	2. Accordance with priorities in the recipient country	Does the project accord with the priorities, strategies and policy directions of the recipient country?	ODA status of the recipient country, importance of each sector and the development of change, and policy and strategic documents.	<ul style="list-style-type: none"> <li>· Review of the plan on national development strategies of Myanmar.</li> <li>· Review of national food security plan.</li> <li>· Review of document and plan related to the Ministry of the Food and Agriculture.</li> <li>· Use of statistical data of OECD/DAC member countries.</li> </ul>
Local and sector-based policies	3. Connection with local government's sector policies in the project village	Is it the sector the local government puts the top priority on?	Policies and strategies of the local government about the sector.	<ul style="list-style-type: none"> <li>· Consideration of strategic importance of upper Myanmar.</li> </ul>
		Do goals and contents of the project accord	Understanding of the policies and strategies, and its	<ul style="list-style-type: none"> <li>· Review of a result report on the discussion.</li> </ul>

Classification	Items	Questions	Materials	Confirmation tools and analysis methods
		with local government's policies and strategies for each sector?	reflection on the project plan.	<ul style="list-style-type: none"> <li>Interview with a manager in charge of the project implementation</li> </ul>
		Was there discussion on policies with local government in the planning stage of the project?	Details of meeting for the policy discussion in the planning stage of the project (including frequency, period and agenda).	<ul style="list-style-type: none"> <li>Interview with local government officials.</li> <li>Interview with managers in charge of the project implementation.</li> </ul>
		Was a committee organized to improve the environment for the project implementation under the regular discussion with the local government?	Organization of a committee and its operating status (members, frequency, period and agenda).	<ul style="list-style-type: none"> <li>Review of date and strategic plans of major donor countries.</li> <li>Interview with officials in the committee.</li> </ul>
Project components	4. Relevance of the selection of an implementing organization of Myanmar and the donor country	Are visions and project plans of the implementing organization highly connected with the project?	Vision and details of the project plan, and rate of the project finance out of the whole budget.	
		Does the implementing organization have project performances in the region or sector?	Details of project implementation in the region or sector.	<ul style="list-style-type: none"> <li>Review of data of the implementing organization.</li> </ul>

Classification	Items	Questions	Materials	Confirmation tools and analysis methods
		Does the project accord with specialty and experience of the implementing organization?	Focus area and performance of the implementing organization.	<ul style="list-style-type: none"> <li>Review of data of the implementing organization and interviews.</li> </ul>
	5. Relevance of selection of the site	Does this place need the development aid for the sector compared with other sites?	Index of each sector at the local level.	<ul style="list-style-type: none"> <li>Agricultural development plan in the place.</li> <li>Impact of the agricultural development.</li> </ul>
		Are there any other donor organizations supporting this sector in the place?	Number of other donor organizations, support scale, activities and goals	<ul style="list-style-type: none"> <li>Interview with the department in charge of aid-receiving in the central government and local government.</li> <li>Analysis of donor country's support strategies, project plans and support status for recipient countries, and interview.</li> </ul>
	6. Relevance of the selection of the project site	Are standard and process of the selection of the project site appropriate?	Standard of selection, research methodology (scope and collection of data), number of places to be investigated, and standard-based analyzed materials.	<ul style="list-style-type: none"> <li>Review of a report on pre-investigation/discussion.</li> <li>Interview with the implementing organization.</li> </ul>
	7. Relevance of the selection of beneficiaries	Standard for the selection of beneficiaries.	Criteria for selection and standard-based analyzed materials.	<ul style="list-style-type: none"> <li>Review of a report on pre-investigation/discussion.</li> <li>Interview with related people.</li> </ul>



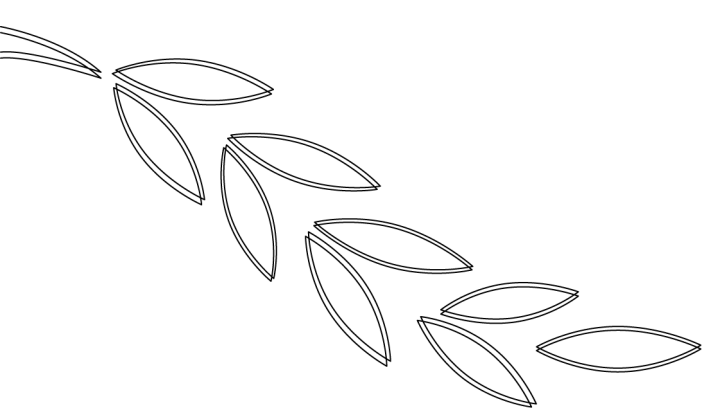
Classification	Items	Questions	Materials	Confirmation tools and analysis methods
Others	8. Validity of goal-setting	Are there systematic relationships between the inputs, outputs, outcomes and goals of the project?	Logical error or jump between goal achievement and the process through activities, and impact of external factors.	<ul style="list-style-type: none"> <li>Review of the PDM.</li> <li>Review of a report on pre-investigation/discussion.</li> </ul>
	9. Validity of the plan	Are time, period, budget and scale appropriate for the goal achievement of the project?	Lack of time, period, budget and scale for the goal-achievement.	<ul style="list-style-type: none"> <li>Review of the PDM.</li> <li>Review of a report on pre-investigation/discussion.</li> </ul>
	10. Reflection of needs of beneficiaries	Were the needs of the beneficiaries reflected well?	Channel of offering suggestions, and process of opinion convergence and its application.	<ul style="list-style-type: none"> <li>Review of the PDM.</li> <li>Interview with the villagers and government officials in Myanmar.</li> </ul>
Efficiency				
Inputs	11. Period required	Were the outputs timely achieved?	Change in the project period.	Field investigation.
	12. Budget	Was the project completed under the planned budget?	Change (increase and decrease) in budget.	Review of the final result report compared with budget.
	13. Manpower	Was the project completed under the planned input of manpower?	Change in the input manpower (frequency and reasons).	Interview with the implementing organization.
	14. Elements	Were the testing building and equipment provided timely as originally planned?	Offering time of the elements.	Interview with the implementing organization and participants in the project in Myanmar.

Classification	Items	Questions	Materials	Confirmation tools and analysis methods
	15. Activities	Were the technical extension services and training offered with appropriate contents during the time needed?	Quality level, frequency and period of the training program.	Interview with the implementing organization and participants in the project in Myanmar.
Mechanism	16. Efficiency of mechanism of the project management	Did communication between KOICA headquarters, the office in Myanmar and PMC go smoothly?	Reporting system and feedback (frequency, period, contents).	Interview with the implementing organization.
		Did communication with the PMC, the recipient country, implementing organization and each beneficiary go smoothly?	Official channel for discussion (frequency, period, contents).	Interview with the implementing organization and beneficiaries.
		Did communication between the PMC and implementing organization go smoothly??	Official channel for discussion (frequency, period, contents).	Interview with the implementing organization.
		Did communication between the implementing organization and each beneficiary go smoothly?	Channel of reflection of opinions of beneficiaries during the implementation period (frequency, period, contents).	Interview with the implementing organization and beneficiaries.

Classification	Items	Questions	Materials	Confirmation tools and analysis methods
	17. Problem-solving structure	For unexpected problems, was there a problem-solving system?	Problem-occurring frequency, and period and subjects of problem-solving.	Interview with the implementing organization, beneficiaries and the office of Myanmar.
<b>Sustainability</b>				
Management strategies	18. Exit strategies	Does the implementing organization have exit strategies? If so, are the strategies appropriate?	Whether or not exit strategies and its validity, and progress of preparation for implementing the exit strategies.	Interview with the implementing organization and review of exit strategies.
	19. Post-management and follow-up measures	Was there discussion on the plan on the size of budget and proper input of human resources to maintain the effectiveness of the project?	Plan on input of human resources and budget allocation.	Interview with the government officials.
		How much budget has been actually executed to maintain the positive effect of the project and realize its follow-up plan?	Details of the budget execution.	Review of the government data and interview with government officials.
Will and capacity	20. Ownership	Have the beneficiaries recognized the performances of the project?	Awareness and satisfaction of the project performance.	Survey targeting beneficiaries Interview with the beneficiaries.

Classification	Items	Questions	Materials	Confirmation tools and analysis methods
		Are there follow-up plans of the local government/impl ementing organization to maintain the performance?	Follow-up plans, budget allocation and details of budget execution.	Interview with residents/villager's organizations and local government.
	21. Capacity building	Are capacities of the implementing organization and beneficiaries built in the implementation process to realize its follow-up plan?	Validity and feasibility of follow-up plans and capacity building.	Interview with the residents/villager's organizations and local government.
Others				
Environment	23. Consideration of the environment	Are some parts able to influence environment considered in the implementation process of the project?	Consideration of environmental regulations (if support for building construction) and complaints received related to the environment from residents.	Interview with the implementing organization, the local government and beneficiaries.





## III. Investigation Results of the Post-Evaluation

1. Opinions and Evaluation from the Stakeholders
2. Capacity building level
3. Directions of Cooperation Development of Related Projects





# III

## Investigation Results of the Post-Evaluation



### 1. Opinions and Evaluation from the Stakeholders

#### 1) Stakeholders in Korea

##### A. KOICA

According to the opinions on the process and performance of the project from KOICA staff participating in the project directly or indirectly, problems and restrictions of the PMC and PM were mentioned. It was revealed that there was a lack of professionalism of the PMC and communication problems with the recipient organization. It seemed to have the relevant implementation process at the stage of discovery and planning of the project, but the nature of the project was not fully understood due to lack of professionalism and related experiences of the PMC, which caused ineffective implementation of the project, such as a poor selection of equipment and insufficient training programs by the dispatched experts.

##### B. PMC

As mentioned earlier, the interview with the PM and staff from Hudigm, the implementing company, participating in the project could not be made available due to their retirement. Even when the project was completed, we asked for their cooperation for the post-evaluation but they were very uncooperative. Therefore, it is



necessary to take actions to make the companies or organizations participating in development projects, such as PMC, compulsorily respond to the post-evaluation or monitoring.

### C. Equipment suppliers

A variety of devices were provided by DainRevo-Tech, which has had many work performances with KOICA, based on a supplier contract. The president of DainRevo-Tech evaluated that the project was implemented at the proper level. The only responsibility of the equipment supplier was purchasing and supplying equipment considering required specification, so it was hard to investigate the relevancy or the level of the equipment, and they just provided a positive evaluation on the process of the equipment supply.

## 2) Stakeholders in Myanmar

### A. MOAI

According to the interviews and surveys with officials from MOAI, opinions on the evaluation on the entire project and opinions on the design of irrigation facilities, computer education, GIS/DB training and international training program in Korea were collected. Generally, it was considered that the capacity of the ITC was improved through the project, and the implementation process and communication with the PMC were mostly satisfactory. Moreover, the results of the project and its sustainability also appeared positive.

On the one hand, when it came to the improvement of the technical capacity and functions of the ITC, there were somewhat conservative opinions, and there were negative opinions on the possibility of income generation or the expansion of farmland, which was recognized as having no direct relationship between these

works and the project. Generally, the contents of the training were considered inappropriate for the practical activities. Particularly, for the GIS/DB education, it just introduced basic contents, so people expressed opinions on the necessity of more practice-based training.

## B. ITC

Employees of the ITC were entirely satisfied with the dispatch of experts and support for the equipment. They answered questionnaires stating that the capacity to use the equipment was improved and were also positive with the testing and analysis for the quality control of the construction being implemented by the ITC. However, they showed conservative answers on the enhancement of abilities of technical personnel and functions of the ITC, and no satisfaction with the education of the use of GIS/DB. This explains why the education by the dispatched experts for staff of the ITC was progressed somewhat inefficiently.

## C. Local construction company in Myanmar

It was evaluated that the local company selected by the PMC was appropriate for the construction of the testing building and the project. However, the company mentioned that there was a communication issue with the ITC in the process of the project implementation related to capabilities of the PMC and the dispatched PM. The company was selected through a bid process like other equipment suppliers. It was only required to do average job performance, so its influence on increasing the quality of project was limited.



## **2. Capacity building level**

### **1) Capabilities of technical personnel of the ITC**

The capabilities of the technical personnel of the ITC are composed of preparation for and preprocessing of samples, testing and analysis by using equipment, interpretation of the results of testing and analysis and completion of a report. Furthermore, the abilities of the plan and design of irrigation facilities, and application to the field by using GIS/DB for the staff of the ITC and MOAI can be also included.

The capacity of each employee of the ITC was able to be assessed based on the improvement of work by using newly-offered equipment because the ITC was being operated before the project, items with testing and analysis, reproducibility and reliability of the results of testing and analysis and enhancement of the interpretation of its results. There were no data on individual's capacity before the project, so the evaluation was conducted focusing on the added items with testing and analysis. By assessing the performance of testing and analysis from the ITC, the testing items asked by the fields or related organizations did not change by much compared with previously, so it is considered that the individual's capacity was not improved much. However, according to the introduction of new equipment such as UTM and education for its use, their external ability seemed to be improved. Based on the answers of survey that education for computerization of the design of irrigation and GIS/DB cannot be applied in the fields due to only basic content-based training, it is considered that the training was not enough to strengthen the abilities of the trainees.

## 2) Capabilities of the ITC

The capacity of the ITC (the organization of testing and analysis) was evaluated based on hardware such as the testing building and equipment, personnel for the analysis, the organization structure, contribution to the quality control for the construction through the results of the analysis, and contribution to the society. The construction of the new testing building and the supply of equipment improved the capacity of the hardware side, and offer of new equipment and education for its use enhanced technical capabilities of personnel. It is hard to evaluate the abilities related to the software side such as the operating system of the ITC, which is far from the project. When it came to the quality control related to construction, it showed high satisfaction, and particularly the testing analyzers used in the field presented high performance. For example, it made a high unexpected external contribution to helping the Mandalay Technological University conduct their research.



## **3. Directions of Cooperation Development of Related Projects**

### 1) Characteristics of the project organization

The Patheingyi ITC, the project organization, is an educational training institute for testing and analysis of soil and materials in the civil engineering field and has the characteristics as below:

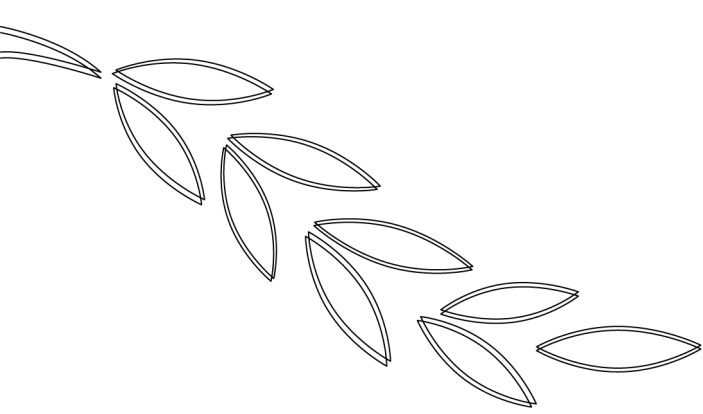
- Specialized research institute already installed and operated in Myanmar.
- Institute requiring the expansion of equipment and facilities.
- Specialized in testing and analysis for soil and materials in the agriculture and civil engineering industries.
- Supporting institute without visual socio-economic results.

When cooperation development projects are planned for this kind of a specialized institute, the characteristics, capabilities and needs should be considered at the stage of planning before the establishment of the strategies as described by the UNDP (2007). Moreover, the organization does not construct irrigation facilities nor draw the results directly but supports work, so it is necessary not to make an abstract or broad interpretation when outcome or impact of the project is set in the process of forming the PDM.

## 2) Improvement of effectiveness

When it comes to international development cooperation projects, if the project is conducted for the specialized analysis organization, close investigation and analysis about capabilities of the organization should come first, then matters the organization needs should be fully reviewed and discussed. There were a variety of devices, but many were not appropriate for testing and analysis and some with high expectation of the ITC were hard to be used due to low specifications. It is considered that there was insufficient investigation on the status related to the technical capabilities and demands, or lack of discussion or professionalism of the PMC.

The issues regarding the professionalism of the PMC were revealed through interviews with the stakeholders, surveys and mid- and final reports. As the result, without a full understanding of the characteristics of the organization for the analysis of soil and materials, the inputs such as functions of the interior testing building, specification and quality of equipment, and training, appeared inefficient. It is desirable to allow Korean specialized institutes that possess functions similar to the organization participate in the project in order to solve these problems. In addition, it is necessary for Korean specialized agencies to supply collectively or provide strategies to have specialized organizations or many experts of each field participate in or review the project.



## IV. Evaluation Results

1. Relevance
2. Effectiveness and impact
3. Efficiency
4. Sustainability
5. Cross-cutting issues and others
6. Comprehensive evaluation



# IV

## Evaluation Results

### 1. Relevance

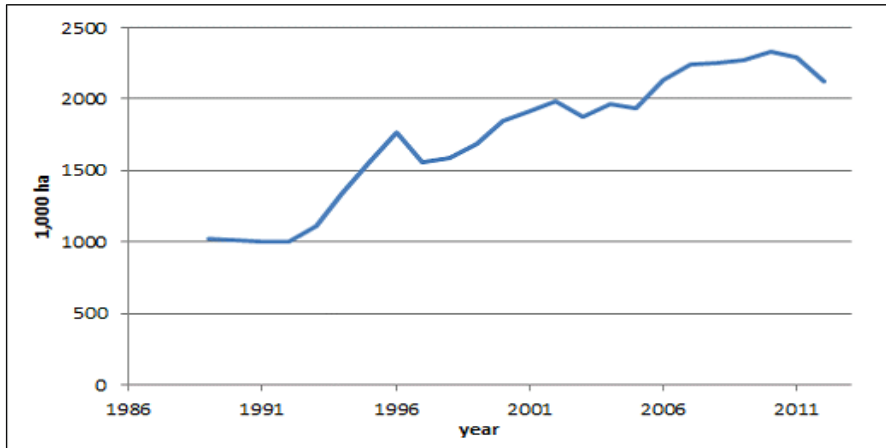
The relevance, as the evaluation criteria, explains the value and availability of the project from the perspectives of the major stakeholders. In other words, relevance indicates how much the development cooperation project accords with the demands of beneficiaries as well as the priorities and policies of the recipient and donor countries. In addition, it not only includes the ends and means but also evaluates the entire process of the project.

#### 1) Relevance for priorities at the government level

##### A. Correlation with demands and policies of the recipient country

There are three policy directions of the agricultural industry in Myanmar: 1) to satisfy domestic demands, 2) to export surplus agricultural products and 3) rural development through agricultural development. In order to achieve these, one of goals is to strengthen the capacity to supply irrigation water. In addition, a stable supply of agro-materials and farming water is also stated as one of the core factors to raise farming productivity. Owing to these policies, the Irrigation Department of MOAI has continued implementing the construction of new dams and weirs. Moreover, besides dams and weirs, the irrigation area with support of farming water through wells or several irrigation facilities has increased as described in Picture 5 below.





<Picture 5. Annual Change in the Irrigation Farmland>

When it comes to the construction of dams, which is mostly managed by Irrigation Department, it is required to conduct testing and analysis of soil and various materials in the process from planning the project including selection of site and design to building the foundation and body of the dam. Even the ITC had to support the testing and analysis, but it did not have the proper devices, and the existing equipment was worn out, so it was difficult to perform the analysis. Therefore, they sent samples to the ITC in Bago, and this took an extended amount of time. The project made a contribution to expanding the irrigation facilities through the support for quick and accurate testing and analysis.

By considering the abovementioned, the objectives and inputs of the project accord with the agricultural policies of Myanmar to improve the farming productivity by expanding irrigation area, and there is a high correlation between the policy and demands of the recipient country.

#### B. Correlation between aid policies of the donor country and plans of each nation

Agriculture is one of the priority sectors of KOICA's grant-type aid projects to

Myanmar, and improving the living environment of residents by increasing agricultural productivity was the one of programs with top priority in 2011. Therefore, the project is appropriate for KOICA's aid policy by raising the farming productivity, and also helps accomplish the MDGs by reducing the population of people living under poverty in half.

## 2) Connection with local and sector policies

As mentioned earlier, Myanmar placed the ITC in charge of carrying out the testing and analysis necessary for expanding the irrigation facilities in two places—Bago, in the southern region, and Patheingyi, in the northern region. As of 2012, Bago had the largest irrigation area of around 370,000ha and Mandalay with the project had the second largest of about 340,000ha. The impact of the project supporting the Patheingyi ITC, which has relatively little annual rainfall, appeared quite high in terms of the effectiveness of the development of water sources for farming. The irrigation water will contribute to double cropping and significant increase in the farming productivity in neighboring areas.

## 3) Relevance of components of the project

### A. Implementing organization

As the implementing organization of the project, Hudigm, as the PMC, DainRevo-Tech, the equipment supplier, and Golden Midas, the local construction company for the testing building, participated in the project. Hudigm, specializing in construction design and management as well as engineering (particularly related to civil engineering), has performed design and construction since its establishment in 1984. According to the report and document related to the project, the PM with work experiences in agriculture and fishery development was involved in the project. For the evaluation, interviews with the PM were scheduled, but all participating

personnel including the PM for the project changed their jobs or retired. According to the interviews with Korean stakeholders, the PMC and PM did not understand the project deeply.

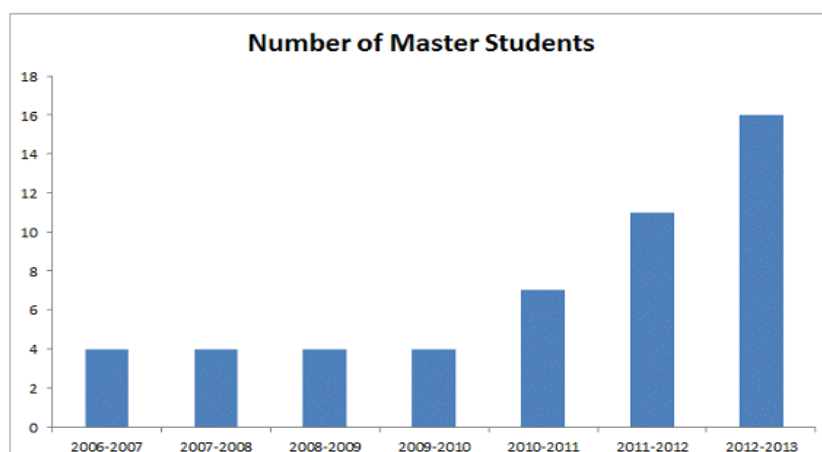
It is considered that DainRevo-Tech, which was in charge of equipment supply, has a better understanding of the development cooperation projects through having had supplied project-related equipment for a long time to KOICA. As a result of checking the equipment installed in the laboratory, some devices were required to be repaired, some parts needed to be replaced with new parts and some had poor specifications or operation due to the budget limitations. There were many kinds of devices provided, so it was hard to review all of them precisely, but it was revealed that specification of some costly equipment was not checked properly by the PMC or related specialists.

The Golden Midas, the local Korean-run company in Myanmar, was in charge of the construction of the testing building and one of the favorable firms for minimizing risks. Even though there were some problems in the process of construction, it nonetheless constructed the testing building successfully. However, when it came to its design, the laboratory was placed without considering its independence, properties of equipment and working environment of personnel operating the equipment. When the characteristics of the testing and analysis of soil and materials were considered, samples had to be carried in and out easily, but there were difficulties in letting waste from the analysis of samples go out because the height difference between the floor of the laboratory and the neighboring ground was quite large. Furthermore, it was also considered that there was insufficient knowledge on laboratory for analyzing soil and conducting basic experiment.

## B. Project sites and organizations

The Patheingyi ITC was originally established in Myittah in 1991 and is in charge of testing of construction materials and quality control of irrigation facilities. In 1995, it moved to Patheingyi, its current location, and started as the irrigation technique center in 2001. Now, it is responsible for not only the testing of construction materials and testing and analysis for the quality control of irrigation projects (its original work) but also education for the management of irrigation facilities. As described earlier, it is in charge of testing and analyzing irrigation facilities being implemented in the northern region and offers education for technical personnel, so it can contribute to expanding the irrigation area in the northern region.

Even though it was not considered during the planning process of the project, it was verified that the devices for testing and analysis of soil and materials were being used for research in the Mandalay Technological University located near the ITC. As it is explained in Picture 6, after the devices were provided, the number of master's degree students who have visited the ITC to use the equipment for their thesis has increased. Therefore, cases of devices for testing and analyzers being supplied or a project targeting a laboratory like this project can produce such positive effects.



<Picture 6. Number of Master's Degree Students Using Devices in the ITC>

### C. Inputs

The inputs of the project include the supply of equipment for testing and analysis of the ITC, dispatch of experts to provide education for irrigation facilities and the construction of the testing building; these have all been evaluated as good elements to strengthen the functions of the Patheingyi ITC. It can be assessed relevant that when it comes to assessing the quality of the equipment or contents of the education, they appear to have been insufficient. During the visit, the device most asked for in terms of supplementation was a triaxial compression tester because education for its analysis method was not enough, and its precision or reproducibility was poor. Thus, there should be follow-up measures.

### D. Beneficiaries

The project is for the organization of testing and analysis of the government, so the first beneficiaries of the project are the staff of the ITC and the implementing organization of irrigation facilities using the results of the testing and analysis. Considering the characteristics and roles of the project, the beneficiaries can be limited but the project can ultimately lead to the expansion of the irrigation area and increase farming productivity, so the residents of the newly-developed irrigation areas are also included in the beneficiaries. Even though it is difficult to divide the boundaries of the beneficiaries, its effectiveness mostly appears positive.

### 4) Other validity

Additional matters to be considered for the relevance of the project are validity of the goal-setting and planning, and the reflection of the demands of the beneficiaries. For the validity of the goal-setting, it is evaluated that the inputs, outputs, outcomes and objectives are systematically connected. For the validity of the planning, period, budget, time and scale of the project are appropriate, and lastly, for the reflection

of the demands of the beneficiaries, the demands of the beneficiaries and the implementation organizations are properly considered. These all seemed relevant but the education period of the design of irrigation facilities and GIS/DB was quite short. According to the evaluation on the training about GIS and irrigation facilities by the staff of the Irrigation Department, the contents of the education were too basic to be applied in the field.

## 5) Evaluation results of relevance

<Table 7> Evaluation criteria and results of relevance

Evaluation criteria	Grade
<ul style="list-style-type: none"> <li>· Relevance for the priorities at the government level</li> <li>· Relevance for the selection of the project site and organization</li> <li>· Validity of the goal-setting and planning</li> </ul>	3



## 2. Effectiveness and impact

The effectiveness of the project evaluation measures the extent to which the objectives were accomplished and is measured depending on the achievement of the original goals based on the objectives' standards. The assessment of the effectiveness is from calculating the performance of the outputs and outcomes.

### 1) Effectiveness

#### A. Outputs

The analysis of outputs has been performed for both the qualitative and

quantitative aspects of the project; in terms of quantity, this included the construction of the testing building, offer of devices for the testing and analysis, and educational programs through the dispatched experts. For the qualitative side, analysis has been done for checking items such as if the testing building has been properly built for its original purposes, the technical extension services using the equipment are appropriate and the educational training is suitable for the capacity building of irrigation technologies.

It is considered that the results of the outputs are appropriate in the quantitative side but insufficient in the qualitative side. Some devices for testing and analysis did not function well, some parts needed to be replaced, and some were not even proper for testing and analysis. When it comes to use of the equipment for testing and analysis, the most important components were preciseness and reproducibility, but some equipment did not satisfied either or both of these. Moreover, some devices such as the triaxial compression tester had not only issue of parts but also lacked educational training for its use, so it was not able to be used for the testing and analysis.

The testing building consisting of a testing and analysis room and a computer room was properly designed and constructed, so there were no major problems for its use. However, the big gap between the floor and the ground made the bringing in and out the samples inconvenient and the space was not divided. Some UPS did not work properly due to some broken parts; these problems were mentioned during the post-evaluation. Moreover, it was built without considering the local climate, which caused inconvenient testing and analysis works, so the recipient organization purchased compact cooling equipment.

Each educational training program based on the final report is described in Table 8 below

<Table 8> Training Programs

Course	Period	Details	Use of equipment
Testing and analysis of soil (33 ITC staff)	May 2010 (4 weeks)	<ul style="list-style-type: none"> <li>• Introduction to soil/geo-engineering, nature and properties of soil.</li> <li>• Plan on soil/site survey, geophysics and drilling.</li> <li>• Collection of samples of soil, testing method in the field.</li> <li>• Methodology of testing and analysis: permeability, soil mechanics, dynamic test, bedrock, consolidation, textural classification, shearing property.</li> </ul>	No description
Applied soil mechanics (35 including the design team)	June 2010 (around 17 days)	<ul style="list-style-type: none"> <li>• Permeability, permeability-related interpretation.</li> <li>• Design of filter to prevent permeability, deep wells.</li> <li>• Compressibility and stemming of soil.</li> <li>• Interpretation and application of principles of shearing strength.</li> <li>• Soil by using software/interpretation of geo-engineering.</li> <li>• Evaluation and interpretation of stability of ground.</li> </ul>	UTM, triaxial compression tester, consolidation testing (1 day)
Testing and analysis of concrete materials (33 ITC staff)	July 2010 (3 weeks)	<ul style="list-style-type: none"> <li>• Mixing ratio of concrete, testing and analysis of aggregates.</li> <li>• Method of testing and analysis of concrete.</li> <li>• Testing and analysis of cement, non destructive test.</li> <li>• Iron tensile strength test, CBR test.</li> <li>• Concrete consistence test.</li> <li>• Cone penetration test, compression strength test.</li> </ul>	No separate description
GIS/DB (14 including staff from MOAI)	October 2010 (7 weeks)	<ul style="list-style-type: none"> <li>• Introduction to GIS: data structure, attributes, cases.</li> <li>• Management and revision of the drawing of the digital map, introduction to satellite image.</li> <li>• Use of GIS: communication, road, 3D representation, transportation.</li> <li>• Comparison of survey technique and digital maps.</li> </ul>	No interpretation for used software

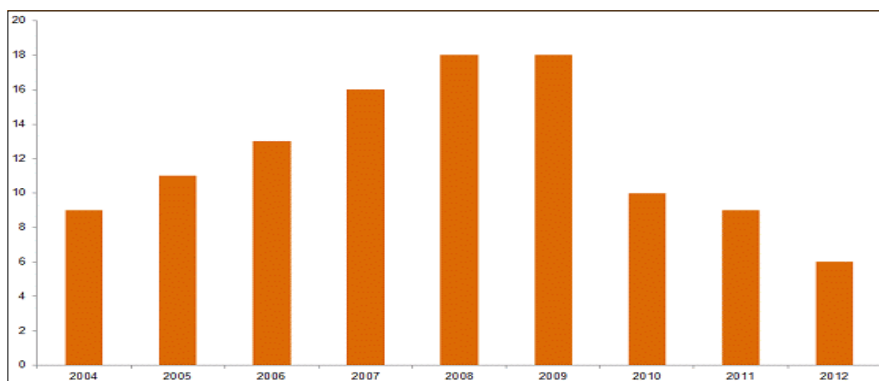


Course	Period	Details	Use of equipment
		<ul style="list-style-type: none"> <li>• Introduction to Korea NGIS: database-building and status.</li> <li>• Satellite image sensing: introduction, database-building and management.</li> <li>• Introduction to GPS: definition, basic principles, cases.</li> <li>• Method of the structure of GIS/DB: planning, design, cases of irrigation facilities.</li> <li>• Case and practices of GIS/DB: reservoirs, pumping stations, irrigation facilities, wells.</li> <li>• Use of GIS: management of the quality of farming water, prevention and management of soil loss, farmland information management, cases of development of water sources of Korea Rural Corporation.</li> </ul>	
Use of equipment for testing and analysis (ITC staff)	October 2010 (7 weeks)	<ul style="list-style-type: none"> <li>• No description</li> </ul>	
Irrigation design/CAD (18 including the local government officials)	November 2010 (8 weeks)	<ul style="list-style-type: none"> <li>• Basic CAD: coordinate system, command, management of individual selection, screen control, attribute alteration, rotation and alignment, hatching, file management, editing, attribute table management (6weeks).</li> <li>• Design of irrigation: practice of retaining wall design, water sources and pollution, non-point source pollution management, 4 rivers restoration project, introduction to Saemangeum land reclamation project, Yeongjong-Cheongra development, Korean rural development, development status of sources for farming water in Korea, multi-purpose dams of Korea Rural Corporation, planning and design criteria, Saemaul Undong (New Village Movement)/rural community development.</li> </ul>	

The educational training was provided by being divided into four courses: 1) theories and practices of testing and analysis of soil and materials, 2) GIS/DB, 3) use of devices for testing and analysis and 4) irrigation design and CAD. Some training such as theories for testing and analysis of soil and materials, and practice of devices dealt with general theories of the field needed for the ITC staff, so it was considered useful. However, the rest of training including GIS/DB, use of the equipment for testing and analysis and irrigation design/CAD just focused on the basic contents, so it was not sufficient to be applied in the field.

## B. Outcomes

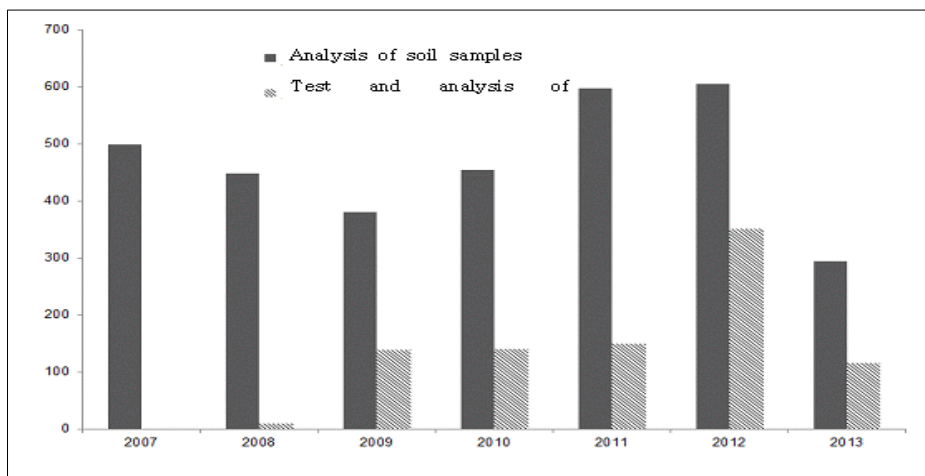
According to the results of the short- and mid-term effectiveness achieved or achievable from the outputs of the project, the testing building, equipment for the testing and analysis of soil and materials and soil training appeared appropriate. The soil training supported the testing and analysis necessary for the construction of dams under development connected with the testing and analysis of soil and materials. The triaxial compression tester important for soil testing had problems with some reasons but most equipment was being in use even during the post-evaluation. Therefore, the testing and analysis of soil and materials necessary for the design and construction of irrigation facilities implemented in the northern region will be continued in the future.



<Picture 7. Annual Change in Dams with Testing and Analysis Support by the ITC for Quality Control>

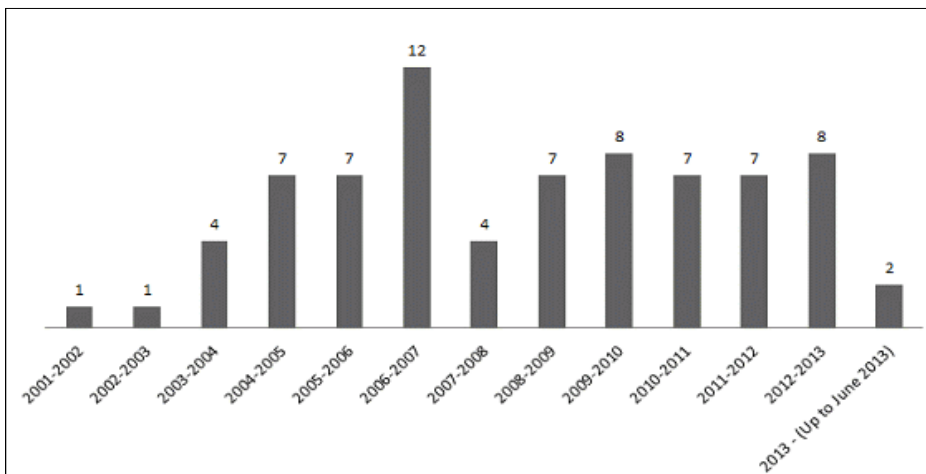
As described in Picture 7, the number of dams has decreased since 2010, which is the result from the project of creating large-sized banks. For example, the pondage of Myogyi and Myittga dams is around 400 million tons, which is five times greater than that of Jangseong Dam (85 million tons), the largest dam for irrigation in Korea. These two also have power capacity of 30MW and 400MW, respectively. The number of the testing and analysis of each dam provided by the ITC has increased after the completion of the project as explained in Picture 8. The testing number in 2013 represented the performance up to April.

According to the survey from the ITC staff, they mostly showed satisfaction or positive evaluation on the dispatch of experts, equipment support, use of the devices, and test and analysis for quality control for the ITC's original work. In addition, employees from the Irrigation Department were also satisfied with the results of the project. However, the ITC staff and people participating in the training expressed somewhat negative response on the period and scale of the training, and generally or partly agreed with the professional level of dispatched experts and the information they offered.



<Picture 8. Annual Number of Testing and Analysis of Soil and Materials per Each Constructed Dam>

The training contents for the irrigation design and design of irrigation facilities by using GIS/DB just concentrated on the basic theories, so it was rarely used on the field and will not be applied in the future. The reasons are that the training was formed without the PMC's examining information on the demands in the recipient organization and having enough discussion, and there was the PMC's poor understanding of the design of irrigation facilities and use of GIS. According to the survey with 20 ITC employees, the use of GIS/DB for the design or management of irrigation facilities through the project appeared negative.



<Picture 9. Annual Number of Training Programs of the Patheingyi ITC>

## 2) Impacts

The impact for the evaluation includes all results from the project, even the negative or unintended ones. In a narrower sense, as the result in a logical model, it includes the skills and knowledge of beneficiaries, and short- and mid-term changes in the work.

The evaluation investigates the use of outputs of the project for the irrigation facilities-related work, the development of farming water and the improvement of

irrigation conditions in the site managed by the ITC, and the increase in agricultural productivity caused by the expansion of irrigation area. Above all, as mentioned in the result analysis, there have been continuous demands on the testing and analysis by using the provided equipment. As unexpected results revealed through a visit to the ITC, the equipment for the testing and analysis in the ITC was being used in the Mandalay Technological University for their studies and research. The professors and students of Mandalay with poor devices for the analysis visited the ITC to use the high-tech equipment. In addition, ITC also supported the testing and analysis of soil and materials needed for the construction of multi-purpose dams, which means the equipment was originally offered for the testing and analysis of the irrigation field but had an impact on the neighboring areas such as universities or other divisions.

### 3) Evaluation results of effectiveness and impacts

<Table 9> Evaluation Criteria and Results of Effectiveness and Impacts

Evaluation criteria of effectiveness and impact	Grade
<ul style="list-style-type: none"> <li>· Accomplishments of qualitative and quantitative objectives of planned outputs.</li> <li>· Continuous demands for the testing building and equipment.</li> <li>· Reinforcement of capabilities for testing and analysis and irrigation technologies of the recipient organization.</li> <li>· Improvement of functions and roles of the recipient organization through the project.</li> <li>· Contribution to expanding irrigation area and increasing farming productivity.</li> </ul>	2



### **3. Efficiency**

The efficiency of the development cooperation project can be defined as the ratio of input resource values versus outcome values, or the proportion of values or effectiveness of the project versus other alternatives. Generally, despite the use of economic evaluation mostly, it is not easy to calculate the result values of the development cooperation project quantitatively in reality. The efficiency of this evaluation was measured based on inputs and mechanisms.

#### **1) Inputs**

##### **A. Period required and budget**

The project was designed to start at the fourth quarter of 2008 and end the late 2010, but actually completed at the first quarter of 2011. The full two-year project period appeared appropriate for the construction of the testing building, supply of equipment and offer of educational training. Moreover, the project budget of around USD 2 million was also proper to implement the project.

##### **B. Human resources**

With an exception of the dispatched experts for construction, it was revealed that the plan on human resources for the project was proper. Considering the characteristics of the project, it is desirable to put more importance on training for the test and analysis and computerization of the design of irrigation facilities than dispatch construction specialists. The period of seven months for dispatching experts was insufficient for the activities of the PM. It is true that there were burdens for the PM on the project management and bid, but there were missing components, such as the connection between capacity building of irrigation technologies and

training for the development of farming water or the design of irrigation facilities. After the development process, facility design and implementation progress were investigated during the dispatch because the ITC had its own education center. If this was reflected in the curriculum of the computerization design of the irrigation facilities, the effectiveness of the training would appear much higher.

### C. Testing building and equipment

Before the project, the Patheingyi ITC had 26 kinds of quality control analyzers in total including 14 for concrete analyzers and 12 soil analyzers. Among those, the oldest one was introduced in 1978, and such equipment were impossible to use and most were worn out, so it was difficult to be applied. Based on this pre-investigation, the project plan was designed to provide new devices such as 19 cement analyzers, 15 aggregate analyzers, 19 concrete analyzers, 1 asphalt analyzer, 22 general analyzers and 6 extra soil analyzers. Due to poor power in the recipient country, it was planned to support a voltage regulator separately. Picture 10 shows the triaxial compression tester provided and three other kinds of triaxial compression testers with similar specification available in Korea. There are relatively cheap devices with high convenience for users, display of measured data on the monitor in real time, data processing and control of testing conditions. Through the project, cheap devices based on the same budget were supplied, which made the equipment hard to be used, and the follow-up actions have to be offered for training for users about repair or part replacement. Therefore, it can be evaluated that the equipment was provided very inefficiently.



<Picture 10. Types of Triaxial Compression Devices>

Generally, there were two kinds of problems on the supply of the equipment; first were some costly devices like the triaxial compression tester had low specification, so the testing results were not reliable, and second, low specifications made the education difficult. During the site visit for the post-evaluation, the matters asked by the ITC staff were related to the equipment, for example the replacement of parts for normal use of the triaxial compression tester and additional training to raise skills for use of the equipment. Therefore, the efficiency of the testing building and equipment appears quite low.





Soil Test Lab



Material Test Lab



Sample Preparation Room



Concrete Test Lab

<Picture 11. Laboratory in the Testing Building of the ITC >

#### D. Activity inputs

Dispatching one expert on the construction for three months was considered an inefficient input considering the properties of the project. The opinion of the expert to build a testing building was fully reflected in the process of the design, and the dispatch of experts on the irrigation was not enough, so its input appeared low. When it came to the dispatch of specialists on testing analyzers, by considering types of the testing analyzers provided, specialists of each field such as the testing for soil and materials had to be sent separately. It is better to dispatch specialists who have experiences in the research institutes or universities, because they have the abilities to interpret the use of the equipment and its results. In addition, the training for the testing analyzers should focus on the interpretation of the testing analysis and its results rather than the operation methods of the devices.

The training for the irrigation design and GIS/DB fields by the dispatched experts were appropriate for the required period, but its effectiveness was quite low from the qualitative side, because the introduction of basic theories could not achieve capacity building (one of goals of the project). As mentioned earlier, during the dispatch of experts on the irrigation, it was bad that the computer education did not consider the design or plan of the irrigation facilities, or their practical abilities. Therefore, it is considered that the education should be offered by sending specialists of each field in cooperation with related organizations.

## 2) Mechanism

### A. Project management

According to the project-related report or interviews about the implementation of the project, it is considered that the communication between the office, PMC, equipment and test building construction company and recipient organization went smoothly. Even though there was no negative evaluation on the surface because of the national atmosphere of Myanmar and the official meeting, it is assumed that the fact that they asked for the follow-up actions about the GIS education, quality issues of some devices and educational training showed there was insufficient interchange of ideas in advance.

### B. Problem-solving structure

The construction of the testing building was built within the period but the completion ceremony was delayed around two months due to the budget issue of Myanmar. There was no problem on the offer of training by the dispatched experts and equipment for the testing and analysis, so some issues occurring during the implementation were properly solved. However, according to interviews, the triaxial compression tester had some problems, which made the testing and analysis difficult, so it was revealed that some issues were not addressed appropriately in the process of the project implementation.

### 3) Evaluation results of efficiency

<Table 10> Evaluation Criteria of Efficiency and its Results

Evaluation criteria of efficiency	Grade
<ul style="list-style-type: none"><li>· Inputs set properly?</li><li>· Input activities implemented through reflecting the specialized areas of the implementing organization?</li><li>· Communication between each organization go efficiently?</li><li>· Mechanisms for the project management.</li><li>· Solving-structure for unexpected problems.</li></ul>	1



## 4. Sustainability

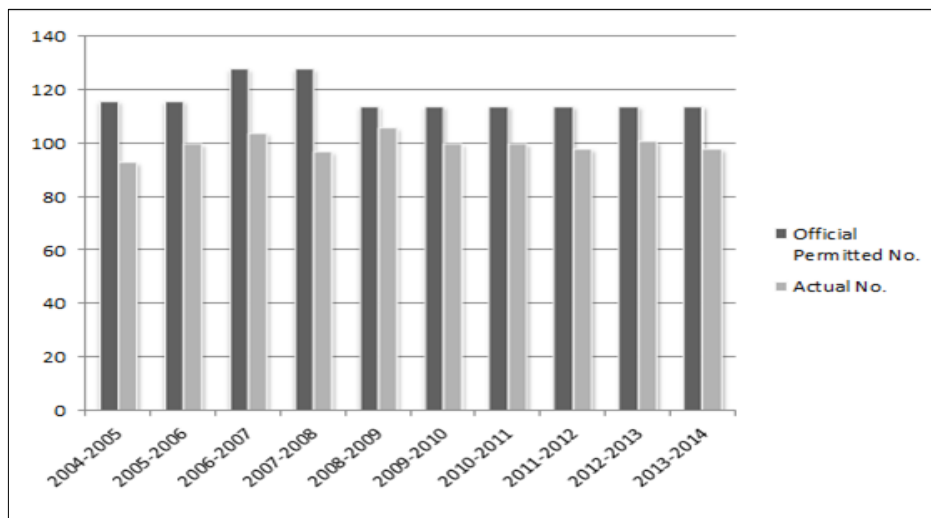
The sustainability is defined as the extent of how much the project is continued with positive effectiveness even after the completion of the project, and it evaluates the possibility of how it will be sustainable in the future rather than how much was actually sustained and to which extent the positive impact can last. To evaluate sustainability, the management strategies and whether or not the recipient organization and MOAI can use and maintain the outputs with strong will and capabilities were evaluated.

### 1) Management strategies

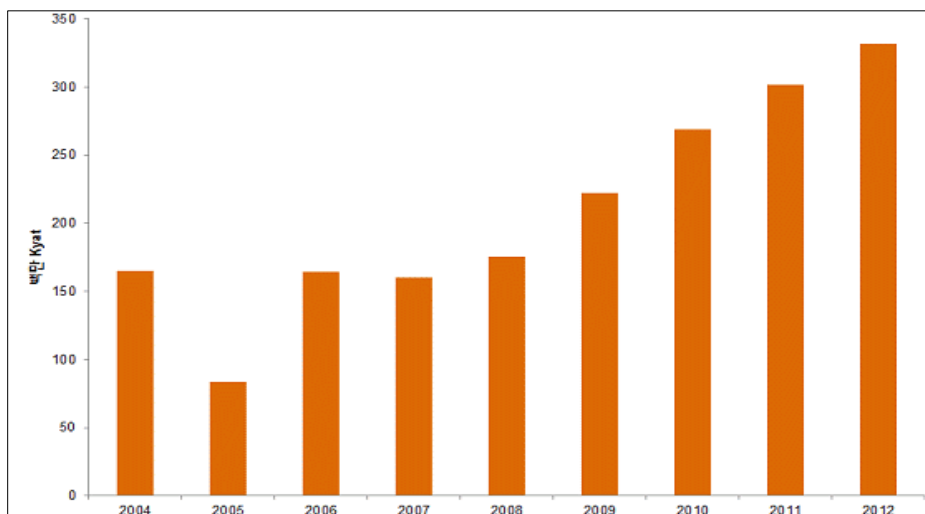
The exit strategies, post-management and follow-up actions were analyzed to evaluate the management strategies. The ITC, which existed before the project, has offered training for the government officials involved in the testing and analysis and irrigation. According to the data from the ITC, it was revealed that this function lasts even after the completion of the project, and there was change in their performance from the past to the present. Based on the investigation of the kinds and number of the annual testing and analysis, there was change depending on the scale of the

construction of dams and the number of the field in upper Myanmar. Moreover, the interview performed at the ITC stressed that the accommodation for trainees should be expanded and improved.

Through the equipment and training provided for the project, the scope of work of the ITC, such as test and analysis, were partly increased. It is considered that the request for the additional support for the equipment for water quality, repair of broken devices or replacement of parts and more training to use some equipment during the visit for the post-evaluation is to expand and strengthen the functions of the ITC. In other words, it represents that the impact of the project will last, and particularly the Myanmar government's budget allocated to the ITC has increased since 2009. The budget includes all working expenses and cost for personnel of the ITC, so it can be considered that the Myanmar government's follow-up action for the ITC is very positive. Considering the number of employees at the ITC barely fluctuates, it is easily recognizable that there has been continuous budget and actions by the government to maintain the ITC and its functions after the completion of the project.



<Picture 12. Number of Employees Allocated in the Patheingyi ITC>



<Picture 13. Annual Budget Change of the Patheingyi ITC>

## 2) Will and capabilities

When it comes to the sustainability of the project, the most important factor is ownership of the irrigation department of MOAI and employees of the ITC. According to the survey, they considered the project mostly positive. Moreover, the central government's budget support for the ITC will keep growing and the project has helped the roles of the ITC become more enhanced.

Opinions expressed during the visit to the ITC were: request for addition training for some devices with insufficient education provided, actions for the repair or replacement of parts and more education for case-based GIS/DB and computerization for the irrigation design. It is true that these requests were spurred by insufficient training by the project, but it also describes that there should be follow-up plans by the ITC in the future. Through this, the ITC can be more strengthened, and accordingly, the sustainability of the project will rise.

### 3) Evaluation results of the sustainability

<Table 11> Evaluation Criteria and Results of Sustainability

Evaluation criteria of sustainability	Grade
<ul style="list-style-type: none"><li>· Extent that functions and roles of the implementing organization are required after the completion of the project.</li><li>· Support of the Myanmar government for the implementing organization and its use.</li><li>· Future plan of the implementing organization and prospect of its roles.</li><li>· Exit strategies and relevance.</li><li>· Relevance of post-management and follow-up measures.</li><li>· Ownership of beneficiaries by the project.</li></ul>	3



## 5. Cross-cutting issues and others

The project was implemented inside the site of the ITC, so there were almost no inputs which can influence the environment in the process of the project implementation. However, it had a possible impact on the health of the employees due to the dust as the samples dealt with in the laboratories were soil and construction materials. The original plan on the design of the testing building and the arrangement of auxiliary equipment did not include the installation of a vent, but it should be supplemented due to the working environment.

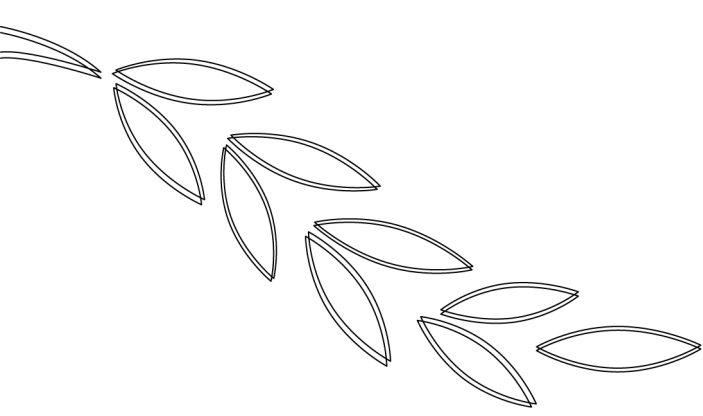


## 6. Comprehensive evaluation

The PMC does not have much professionalism on the field, so some inefficient parts were found in the process of the implementation of inputs and development activities. Even though the PM was dispatched from each specialized area to implement the project, their roles were limited. Some devices were provided without appropriate training, and education on the plan and design of irrigation facilities requested by the recipient organization dealt with only basic theories, so there was restriction on the improvement of practical abilities. Therefore, the efficiency appeared quite low in the process of the project implementation. Table 12 represents the evaluation results and the grade of relevance, effectiveness, impact, efficiency and sustainability from the planning to the post-evaluation of the project.

<Table 12> Comprehensive Evaluation Results and Grade

Items	Results	Total grade average	Grade
Relevance	3	9	Successful
Effectiveness and impact	2		
Efficiency	1		
Sustainability	3		



## V. Conclusion and Proposals

1. Conclusion
2. Lessons and Proposals





## 1. Conclusion

This evaluation was to conduct the post-evaluation on the project “Capacity Building for Irrigation Technology in Upper Myanmar” implemented from late 2008 to late 2010. The project included the provision of equipment for testing and analysis, construction of the testing building and training by dispatched experts targeting the Patheingyi ITC located in Mandalay, Myanmar. For the evaluation, the project-related materials were reviewed, interviews with stakeholders both in Korea and Myanmar were held and field investigation was conducted. The evaluation was conducted based on the evaluation matrix, and its results are as follows.

<Table 13> Summary of Criteria-Based Evaluation Items and Results

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
Relevance	Accordance with priorities and policies at the government level	Accordance with the policy directions of the recipient and donor countries, and contribution to the expansion of irrigation area in Myanmar.	Not applicable (N/A)
	Relevance with the project site and correlation with policies	A new project of the construction of dams for farming is being implemented in the northern region, the	N/A

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
		irrigation facilities will be also planned to be expanded, so there was the stable testing and analysis support for those projects.	
	Relevance of the selection of the implementing organization	The implementing organization, as the project organization, played an important role in the agricultural policy of the recipient country.	The PMC lacked professionalism, so the project was not implemented efficiently. It is necessary to cooperate with testing and research institutes involved in works similar to the implementing organization.
	Relevance of selection of the project site and beneficiaries	Both growing qualitative and quantitative testing and analysis were satisfied and there was effective support for the irrigation project in the northern region.	N/A
	Validity of the goal-setting	The goals and elements of the project were relevant for the demands of the recipient country, and there were systematic relationships between inputs and results of the project.	Experts of each field should be dispatched considering not only the quantitative part but also training contents related to the fields qualitatively.
	Validity of the project plan	No major problems on accomplishment of the goals such as period or budget.	N/A

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
	Reflection of needs of beneficiaries	Properly planned by reflecting opinions and needs of the implementing organization from the planning of the project.	In the process of the project implementation, some parts did not fully show the content of the training.
Efficiency · Impact	Quantitative and qualitative accomplishments of each planned input	The planned inputs were put during the project period relevantly in the quantitative side.	Some provided low-quality equipment was required to be repaired or whose parts needed to be replaced. Training for the use of the equipment was not provided sufficiently. When it came to the training for computerization of design and GIS/DB, it only focused on the basic theories, so it could not satisfy the expectations of the implementing organization.
	Implementation of testing and analysis by using the provided equipment	Supply of new equipment made some areas of the testing and analysis which were not able to be conducted possible. There were also unexpected results of neighboring university's using the equipment for their thesis or research, and the analysis was done for the	The use methods of the triaxial compression tester with high possibility of availability were not provided according to each type, so it was hard to be applied in the field.

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
		implementation of the plan on the general construction project.	
	Improvement of practical abilities through the technical extension services	It was properly provided for the soil training.	The computerization of the design of irrigation facilities or GIS/DB training consisted of just basic contents or introduction, so it showed limits to be applied in the field, which is caused by the fact that the PMC with professionalism in the area did not understand practices and technical skills of the implementing organization through discussion before start of the training program.
	Continuous works by using the equipment	According to the agriculture-related policies in Myanmar, the project of the expansion of irrigation facilities was continued to be implemented, so the testing and analysis works have consistently occurred.	Some equipment could not be used, which gave difficulty to be applied, so follow-up measures should be taken.
	Contribution to the active implementation of the project of irrigation facilities by using outputs	Great contribution to the project implementation through continuous training for testing and analysis works	The testing using the triaxial compression tester was limited, and the project to design irrigation facilities by using GIS/DB was

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
	of the project	and irrigation technologies by using a computer.	implemented insufficiently.
Efficiency	Inputs and activities provided efficiently?	Many testing devices were offered as planned and the training program was completed as scheduled.	Some equipment and parts needed to be repaired and replaced respectively, and the additional training was required for the use of some devices for testing and analysis, so it appeared quite inefficient.
	Input of human resources considering efficiency proper?	Except dispatched experts on the construction, the plan and performance of the dispatch of specialists were mostly appropriate.	Despite no big possibility of the experts in the construction, it was originally planned, and irrigation experts worked as the PM, but they could not contribute to improving the design of irrigation facilities or the related practical abilities.
	Efficiency of mechanisms of the project management	No big problems due to the communication system between the implementing organization and PMC.	Because of low professionalism of PMC, the review of specification for the selection of equipment in the process of the project implementation and organization of the contents of the training program were conducted without enough collection of opinions from the implementing organization.
	Problem-solving structure	No unexpected problems.	

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
Sustainability	Appropriate exit strategies	By strengthening functions and roles of the implementing organization which was already being operated before the project, there was no need to have separate exit strategies.	Insufficient user's manual, extra parts and contact system for repair.
	Post-management and follow-up measures	The Myanmar government recognized the importance of the implementing organization, and the support for the budget and personnel was excellent. The original functions of the ITC were continuous and strengthened.	N/A
	Ownership	The ITC staff and the irrigation department recognized the performances of the project and they knew the significance of the testing and analysis of the project of irrigation facilities.	N/A
	Capacity building	Construction of the testing building and offer of the equipment for the testing and analysis helped strengthen the existing work and the capabilities of the implementing	Some were hard to be used, so the follow-up measures were required. The training for computerization of the design of irrigation facilities and the plan on the irrigation facilities by using GIS/DB only

Classification	Items	Results	
		Excellent or positive	Improvements to be required or inadequate
		organization.	included basic theories and was provided without the full preparation, so technical capacity building could not achieved.
Others	Environmental impact during the project implementation	The project was implemented within the existing ITC, so there was no significant environmental impact.	No enough measures for cleaning dust inside the testing building occurring in the process of handling samples.

To sum up the results, the plan and implementation of the project were mostly relevant, and the Myanmar government has recognized the importance of the functions and roles of the implementing organization, so its sustainability can be considered positive. However, it is assessed that the evaluation results of efficiency, effectiveness and impact of the project related to the implementation process were not sufficient. Particularly, the PMC was not professional enough, so its efficiency appeared quite irrelevant, but its effectiveness and impact were considered relevant. In other words, the contents and goal-setting of the project were appropriate but the activity performances of the inputs and dispatched experts in the implementation process of the project appeared insufficient. The evaluation results were summarized in Table 14 below.



<Table 14> Summary of Criteria-Based Evaluation and Grade

Relevance	Effectiveness/Impact	Efficiency	Sustainability	Result
<ul style="list-style-type: none"> <li>- Adequate for development goals and strategies of the recipient country.</li> <li>- Continuous development of irrigation project in the site implemented by the ITC, and provided testing and analysis and the results necessary for the site.</li> </ul>	<ul style="list-style-type: none"> <li>- Accomplishment of the construction of the testing building, and provided equipment and training by dispatched experts.</li> <li>- Continuous testing and analysis by using the provided equipment.</li> <li>- Despite problems on some equipment, the Mandalay Technological University used it for their research.</li> </ul>	<ul style="list-style-type: none"> <li>- ITC staff and employees from the irrigation department considered it quite successful.</li> <li>- Due to lack of the PMC's professionalism, the training for the use of equipment or education by the dispatched experts was not effective enough.</li> </ul>	<ul style="list-style-type: none"> <li>- There was continuous increase in the ITC budget after the completion of the project.</li> <li>- The testing and analysis necessary for the construction site for dams in upper Myanmar has been continuously conducted.</li> </ul>	Successful
3	2	1	3	9



## 2. Lessons and Proposals

The project conforms with the Myanmar government's policies to expand the irrigation area to improve farming productivity. This is not directly performed through the project but rather by contributing to the planning and construction of active irrigation facilities such as dams or weirs by strengthening technical capabilities for the Patheingyi ITC, which is in charge of the testing and analysis of soil and materials. According to the evaluation, it was revealed that the project was successfully completed but there was something insufficient. To raise the completion of the project and the sustainability, there should be follow-up actions. Proposal for the project and lessons for the similar projects are as follows.

## 1) Proposal for the follow-up actions

### A. Equipment for the testing and analysis

#### (1) Repair of equipment and support for consumables

Some equipment did not operate normally due to breakdown or the broken parts, so it is necessary to take follow-up actions to repair those devices which are hard to be fixed in Myanmar. In addition, reagents or consumables are required for the operation of some devices, so if those cannot be secured in Myanmar, there should be aid to be provided. The equipment will be used properly only if there is relevant follow-up support.

#### (2) Manual for equipment operation

Even though an English manual was offered for each of the equipment, the manual should be more detailed. In addition, an instruction which clarifies the standard of the parts with the specification of the devices was not provided, but it is necessary to secure alternative parts or maintain the devices. It is also essential to take actions for the maintenance of the equipment in the recipient country. However, many Korean companies did not provide detailed specifications in Korea. Thus, when it comes to devices offered for the development cooperation project, there should be long-term measures of preparing for an English version. The additional materials asked by the ITC are an English version of KS about the testing and analysis of soil and materials. When equipment with complicated instructions is offered, a manual including more details and specification should be provided.

#### (3) Maintenance and calibration education

Measuring devices should require regular maintenance, compensation and calibration. The project only offered training for the use of the analyzers, so

additional education for compensation and calibration with the supply of the standard samples for the calibration should be given.

#### (4) Supply of extra equipment

As the irrigation facilities by using various water sources are expanded, there is bigger interest in the quality of farming water, so the recipient organization stresses the necessity of the analysis of the water quality. The Bago ITC, in the northern region of the country, already has the analyzers for the water quality, so they have started the work to analyze the water quality. The analyzers for the water quality to evaluate the appropriateness of farming water does not require bigger budget, so additional support should be considered.

### B. Technical extension services

#### (1) Training for equipment-connected testing and analysis methods

The training provided based on dispatching experts was about the use of the equipment. When it comes to applying some devices, it is important to understand the purpose and method of the equipment. However, the education on the use of the equipment and method to testing according to the kinds of soil and materials was not provided properly. To strengthen the capabilities of the ITC with testing and analysis, it is necessary to perform testing and analysis by using the equipment and improve reliability of data. Therefore, utilizing research manpower for testing and analysis should be considered.

#### (2) Computer education for plan and design of irrigation facilities

IT education on irrigation technology was provided by mostly focusing on basic theories. To build a dam or a weir, it is significant to offer additional

training programs based on understanding the irrigation technology from feasibility test, design, construction to management implemented by Myanmar. Therefore, the contents and range of additional training programs should be examined in consideration of budget of the follow-up actions.

### C. Use of experts

#### (1) Dispatch of additional KOICA experts

During the visit to the ITC for evaluation, it was evaluated that the role of KOICA volunteers and experts was positive. It can be considered that the volunteers and experts of each field expanded the project and raised its sustainability, because they were able to request repairs for equipment or necessary consumables, and supplement missing portions of the project. If more specialists with abundant experiences on the testing and analysis of soil and materials can be sent, it will help the success of the project.

#### (2) Correlation with similar organizations in Korea

It was evaluated that the effectiveness of the training program showed limitations, because the education could not be applied in the field due to limited period of dispatch of experts and contents with only basic theories. Therefore, if there is a plan to send specialists as follow-up measures, the plan of training program and dispatch of experts on testing and analysis should be carried out in partnership with research institutes involved in similar works in Korea.

### D. Remodeling of the testing building to raise its utilization

#### (1) Improvement of interior work environment

During the visit, the testing and analysis were not conducted in the ITC

laboratory but it was easily recognized that the interior environment can be polluted by dust caused by the construction materials mainly treated. Therefore, it is necessary to install a vent pipe, because the dust can cause malfunctions or promote difficulties in running the equipment. In addition, partition walls need to be installed inside the laboratory to separate, and it is also desirable to place an air conditioner to improve the working environment and organize the devices by type.

## (2) Improvement of accessibility for carrying-in and out of samples

It is difficult to carry in and out samples due to the big height gap between the floor of the testing building and the ground, so if the follow-up measures are prepared, it should consider improving the accessibility by installing a slope for the convenience of transporting the samples. Particularly, if the amount of samples is large, this kind of supplementation is required because the transportation devices such as a cart should be used.

## 2) Lessons for the similar projects

### A. Project planning stage

#### (1) Selection of experts for consultation

It is evaluated that the experts participating in the feasibility testing or discussion in the process of planning the project do not have enough knowledge on the area related to the ITC. Taking a look at the specialists on the project planning, they were all involved in the related field but not many experiences on the testing and analysis of soil and materials. Particularly, the specialized areas in the project were the testing and analysis of concrete, computerization of irrigation design and GIS/DB among the irrigation of agricultural engineering, whose range is very limited. Therefore, specialists of

the mentioned fields should have been dispatched. It is necessary to secure experts not only from the KOICA pool but also more qualified specialists in the stage of project planning and pre field investigation. If more specialized experts of each field are secured in the stage of planning, implementation and evaluation of the project, the concreteness and completeness of the project can be greatly raised. Therefore, it is essential to have experts to participate from the planning of the project which prepares for the feasibility report or implementation plan, implementation to the evaluation, or to ask for consultation from an advisory group.

## (2) Selection of the implementing organization

It is not easy to select the most appropriate PMC due to the systematic limit of open competition, but the professionalism of the implementation organization should be inspected deeply. For the project, the PMC was not specialized that much, so people who had experience of working in the related organization were employed to implement the project. The level of professionalism of the PMC was too low to perform the project, but the project included the construction of the testing building, so it is considered that the company with many experiences on the architectural design was selected. Furthermore, the architects were dispatched over the required period.

## (3) Review of the possibility of expansion of the project outputs

An unintended yet positive result of the project was the use of equipment in the Mandalay Technological University. The university lacked devices for testing and analysis, and thus its students visited the ITC to use them for their research and thesis. Consequently, the utilization of the equipment in the ITC was greatly increased. Therefore, when a project is performed for an organization specializing on the testing and analysis next time, it is also useful

to investigate whether or not there are universities or research institutes in the vicinity.

## B. Project implementation stage

### (1) Training program

International training or educational programs are easily operated in cooperation with KOICA, but training for specialized areas such as testing and analysis requires professionalism. Examining the training by the recipient organization, the curriculum included just basic theories on CAD and irrigation facilities and almost always focused on the fundamental principles of GIS/DB. It is true that the basic principles are sometimes necessary depending on people's prior knowledge but this content was far from the original project plan. There should be close discussion with the recipient organization on the training program and its content, which needs professionalism on the appropriate field. If the PMC is specialized in the necessary area, there would be no difficulty in the process. If training is provided for the specialized recipient organization in the future, the participation and advice of outside experts to plan and organize curriculum can help offer more efficient education.

### (2) Selection and purchase of equipment

The total of 124 kinds of devices for testing and analysis were provided for the project, and almost all devices with various kinds including universal equipment used in the laboratory were appropriately purchased. However, some costly devices were offered without considering its purpose and application, so each piece of equipment should be examined to know the original purpose of the testing and analysis by the experts. If the purchase and supply of the equipment which were determined on the final report on

the project discussion and the project implementation plan, and purchased based on the order of KOICA were performed by considering advice of experts and review of specification, more effective equipment would be provided. In addition, when the PMC purchases and supplies the equipment, it is essential to have qualified personnel or experts from the outside review them.

### (3) Construction of buildings

Similar to the equipment, it was revealed that the general plan for the construction of a building was prepared with the final report on project discussion and the project implementation plan. The process of preparing for the plan was not clear, but it is important to design the testing building for the testing and analysis by considering essential matters to implement works for testing and analysis through advice from the related organizations and experts. If the project was completed based on the examination of the related organizations or experts, there would be no problems on accessibility of the testing building or arrangement of interior space.

## C. Post-management and follow-up actions

### (1) Correlation with KOICA experts

After the completion of the project, the dispatch of volunteers and experts on the civil engineering to the ITC was considered positive. The recipient organization considered it as one of the follow-up actions of the project, and the education for the use of equipment and computer easily applied in the field was evaluated positive. The devices provided are various and some equipment requires high skills, so the effectiveness and sustainability of the project can be raised by sending specialists of each field for a long-term period.

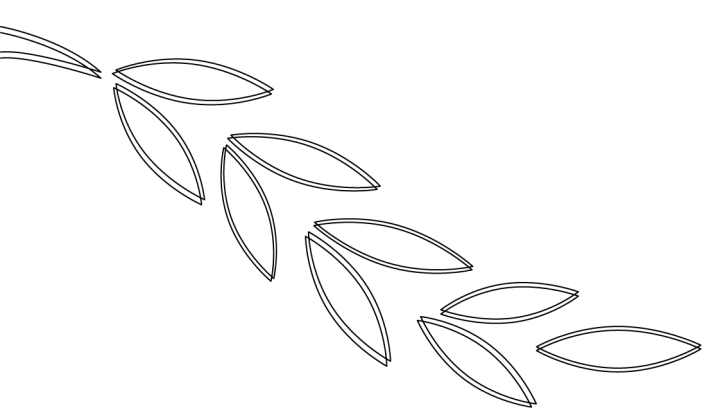


## (2) Establishment of the sustainable management plan for equipment

It is necessary to have a more stable and sustainable system for similar projects including educational training for the use of equipment for testing and analysis. When it comes to the devices for testing and analysis, it is essential to maintain them through calibration, replacement of parts and regular inspection, and particularly, calibration depends on reliability of the testing and analysis. Therefore, the management protocol should be prepared to help an institute for testing and analysis use the equipment continuously for the development cooperation projects.

## (3) Establishment of a network with similar organizations in Korea

Organizations involved in similar testing and analysis or research institutes know the importance or necessity of the individual work. Therefore, it is desirable to include similar organizations in Korea involved in capacity building projects for testing and analysis or have advisory teams during the project implementation. Also, there should be also support for long-term based exchanges between organizations. It can also raise the effectiveness of the project by checking specification in the process of selecting the equipment, and maximize the effect of the project by inviting specialists for the training programs as well. Particularly, it can anticipate the exchanges of human resources and technologies, so its impact can be greater than originally expected.



## Reference





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## Reference



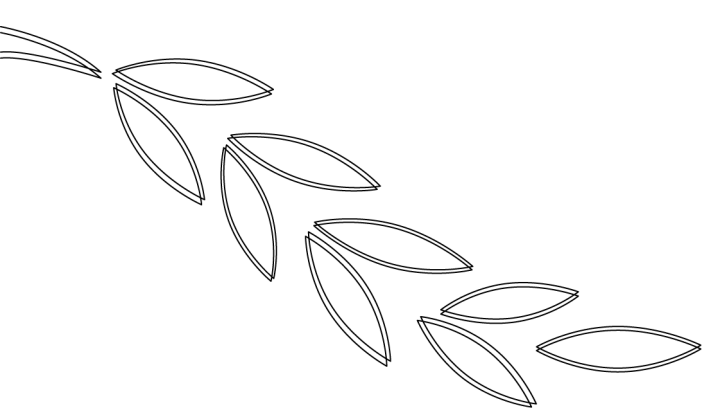
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## Appendix

1. Field Investigation and Results
2. Questionnaire Survey to the Project-Related Department in MOAI
3. Questionnaire Survey to ITC Staff and Stakeholders
4. Questionnaire Survey to Participants in the Training Program





# Appendix



## 1. Field Investigation and Results

### Schedule and Results of Field Investigation

#### 1. Overview

##### A. Objectives

To perform the post-evaluation of the project “Capacity Building for Irrigation Technology in Upper Myanmar.”

##### B. Participants (Evaluation team): 2 persons

Yeungnam University

Prof. Han, Dong-Geun

Hankyong University

Prof. Hong, Seong-Gu

##### C. Period

Monday, July 1, 2013 – Sunday, July 7, 2013

##### D. Sites

(1) Irrigation Technology Center (ITC)

(2) Central government – Irrigation Department of MOAI



## 2. Visiting programs and interviewees

Date		Details (including the field investigation)	Participants
July 1 (Mon)	Evening	Arrival at Myanmar	Incheon → Yangon
July 2 (Tue)	Morning	Report on starting the field investigation in the KOICA office in Myanmar	Evaluation team and Sin, Man-Sik, Director of KOICA in Myanmar, Lee, Min-Jeong, Deputy director of KOICA in Myanmar, Sin, Jong-Su, an expert, and Jo, Han-Na. Evaluator in KOICA
	Afternoon	Moved to Mandalay	Yangon → Mandalay
July 3 (Wed)	Morning	Inspection of facilities and equipment in Patheingyi ITC, and investigation of the operation conditions (by collecting questionnaires distributed in advance)	Evaluation team and Jo, Han-Na. Evaluator in KOICA Mr. Zaw Min Htut – Manager in charge of all affairs of ITC Ms. Nu Nu Htwe – Manager in Patheingyi Mr. Kyaw Thu – Deputy director of the Irrigation Department in Mandalay Around 10 employees in Patheingyi ITC
	Afternoon	Moved to Naypyidaw	Mandalay (Patheingyi) → Patheingyi
July 4 (Thu)	Morning	Visit to the MOAI Investigation of the project-related status (by collecting questionnaires distributed in advance)	Evaluation team and Jo, Han-Na. Evaluator in KOICA Mr. Soe Myint Tun, Deputy director of the Irrigation Department Ms. Aye Aye Hlaing, Deputy Director
	Afternoon	Additional discussion and data collection in MOAI	Mr. Soe Htun Aung, Deputy Director Mr. Zaw Win Chit, Deputy Director

July 5 (Fri)	Morning	Data collection requested additionally and discussion in MOAI	Evaluation team and Jo, Han-Na. Evaluator in KOICA Mr. Soe Myint Tun, Deputy director of the Irrigation Department Dr. Mu Mu Aung, Staff Officer Mr. Soe Htun Aung, Deputy Director
	Afternoon	Moved to Yangon	Naypyidaw → Yangon
July 6 (Sat)	Morning	Interview with the president of the construction company	Evaluation team and Jo, Han-Na. Evaluator in KOICA Kim, Guk-Tae, President of Golden Midas (construction company to build the testing building)
	Afternoon	Report on the completion of the field investigation in KOICA office in Myanmar	Evaluation team and Jo, Han-Na. Evaluator in KOICA Sin, Man-Sik, Director of KOICA in Myanmar Lee, Min-Jeong, Deputy director of KOICA in Myanmar
July 7 (Sun)	Morning	Organization of results of the field investigation and review of collected materials	Evaluation team
	Afternoon	Return to Korea	Yangon → Incheon



## 2. Questionnaire Survey to the Project-Related Departments in MOAI

### Questionnaire for Ex-Post Evaluation on the Project “Capacity Building for Irrigation Technology in Upper Myanmar”

#### Questionnaire to Government Officials related with the Project in General

This questionnaire is designed to evaluate the project “Capacity Building for Irrigation Technology in Upper Myanmar” (hereinafter referred to as “Project”) by the Korea International Cooperation Agency (KOICA).

Please check (✓) the most appropriate answer or write down your comments. Your cooperation would be greatly appreciated and your answers only will be used for this study.

- 90% and more: very satisfied, very agreed
- 80% to 89%: satisfied, agreed
- 70% to 79%: moderate,
- 69% or less: dissatisfied, not agreed
- None: very dissatisfied, very disagreed

#### - BACKGROUND OF RESPONDENT

- (1) Gender:  male  female
- (2) Position:
- (3) Division (department):
- (4) Month/Year when you joined the office:
- (5) Educational background and Major:
- (6) You are a  manager  practitioner (staff)
- (7) Please specify your job:

## 1. Questions about Project Development

1-1. This project is related to the priority in developing and/or managing water resources for irrigation and increasing agricultural productivity in your Country?

- (1) 90% and more,                      (2) 80% to 89%,  
(3) 70% to 79%,                      (4) 69% or less,  
(5) None

1-2. Did the Project meet the needs in developing irrigation technology in your Country?

- (1) 90% and more,                      (2) 80% to 89%,  
(3) 70% to 79%,                      (4) 69% or less,  
(5) None

1-3. Is this project related to the planning for agricultural development in the local/regional government?

- (1) 90% and more,                      (2) 80% to 89%,  
(3) 70% to 79%,                      (4) 69% or less,  
(5) None

1-4. Was there enough communication with local/regional government in the initial stage of developing Project development?

- Yes ( )                      No ( )

1-5. The location of the Project is appropriate compared to other candidate places?

- Yes ( )                      No ( )

1-6. Are there any other official development program being progressed in the Project region (by other country or international organization)?

Yes ( )      No ( )

1-7. What was the criteria or main reason in selecting the location of the Project?

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1-8. The procedure in selecting the Project site was reasonable?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

1-9. The selection of trainees and staff who participated in training program was reasonable?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

## 2. Questions about Process

2-1. The Project as a whole was implemented within the specified period of time?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

2-2. Were there enough communications with PMC in implementing the Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

2-3. Were there any unexpected problem or incidents during the Project implementation?

Yes ( )      No ( )

If yes, please describe them briefly

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2-4. Lab tools and equipment were provided in time so that they were used in the training programs.

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

### 3. Questions about Effectiveness

3-1. How effectively was the Project implemented?

(How successful was the Project in achieving its goals?)

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-2. If not, please explain why:

---

3-3. The Facility and laboratory equipment are provided to meet the objective of this Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-4. Laboratory equipment and computers are being utilized for training officials with satisfaction.

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-5. The Facility and laboratory equipment are being used in planning and management of irrigation projects.

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

#### 4. Questions about Outcome and Impact

4-1. How much do you think the Project improved the technical capability of human resources on irrigation technology in the Project area?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-2. Facility can contribute to development and planning additional irrigation projects?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-3. The Project will provide the increase in crop production area and income of people in the region?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-4. Training program provided by KOICA expert helped improving technical capability of trainees for their job and duties?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-5. The Facility including laboratory equipment are under normal operation and still in use with no serious problems since the completion of the Project?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None



4-6. Invitation training program in Korea was well organized and prepared to meet the objective of the Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

## 5. Questions about Sustainability

5-1. How sustainable is the Project for the future?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

5-2. The Facility is being operated under reasonable management for meeting the objectives of the Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

5-3. Do you expect the Facility will continue to provide reasonable development of human resources related to irrigation and related fields

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

5-4. Do you think the Facility is helping various works related to irrigation, construction, and quality controls?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

\* If you have any suggestions for the improvement of the Project, please let us know.

(                    )

(Thank you for your kind cooperation.)

Please check (✓) the most appropriate answer or write down your comments. Your cooperation would be greatly appreciated and your answers only will be used for this study.

- 90% and more: very satisfied, very agreed
- 80% to 89%: satisfied, agreed
- 70% to 79%: moderate,
- 69% or less: dissatisfied, not agreed
- None: very dissatisfied, very disagreed



### **3. Questionnaire Survey to ITC Staff and Stakeholders**

#### **Questionnaire for Ex-Post Evaluation on the Project “Capacity Building for Irrigation Technology in Upper Myanmar”**

##### **Questionnaire to Staffs working in ITC, Patheingyi**

This questionnaire is designed to evaluate the project “Capacity Building for Irrigation Technology in Upper Myanmar” (hereinafter referred to as “Project”) by the Korea International Cooperation Agency (KOICA).

##### **- BACKGROUND OF RESPONDENT**

- (1) Gender:  male  female
- (2) Position:
- (3) Division (department):
- (4) Month/Year when you joined the office:
- (5) Educational background and Major:
- (6) You are a  manager  practitioner (staff)
- (7) Please specify your job:

## 1. Construction of Facility

1-1. Was the building constructed by Korea appropriate for the objective of the Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

1-2. Was the Irrigation Technology Center building constructed on time?

Yes ( ) No ( )

1-3. If no, please specify how long the delay was:

---

1-4. Do you think those who stayed in the Facility are satisfied with their staying?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

## 2. Questions about Effectiveness

2-1. To what extent did the construction of the Facility help to your job?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

2-2. If there were none, please explain why :

---

2-3. Are the equipment satisfactory to meet the goal of ITC operation?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

2-4. What equipment are you using or operating, including software?

---

2-5. Are you comfortable with using or operating the equipment you are in charge of through the training of the Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

2-6. If none, please explain why:

---

### **3. Questions about Impact**

3-1. How much do you think the Project improves the activities of ITC in terms of contribution to improving human resources in irrigation technology fields?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-2. ITC continues to offer and run training programs to related officials and technicians who are working on irrigation /water resources?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

3-3. How much do you think ITC provides improvements of quality control in construction works in general?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

3-4. To what extent did training program conducted by Korean expert contribute improving staffs' skill and capability in their work?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

3-5. What extent or how frequently are the equipment currently utilizing in the Facility?

- (1) More than expectation
- (2) Frequently or extensively enough
- (3) Fairly
- (4) Rarely

3-6. What extent are the software programs such as GIS and DB in utilization for planning or managing irrigation related projects?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

#### 4. Questions about Sustainability

4-1. Do you think ITC continues to play an important role in training officials and contribute to the development of irrigation and related project?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-2. If none, please explain why:

---

---

4-3. Do you think ITC will contribute to increasing farm land area and income of farmers in northern Myanmar?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-4. If not, please explain why:

---

---

4-5. To what extent do you think the Ministry or government officials have supported and will support to maintain ITC facility themselves after the Project?

- (1) 90% and more,
- (2) 80% to 89%,
- (3) 70% to 79%,
- (4) 69% or less,
- (5) None

4-6. If not, please explain why:

---

\* If you have any suggestions for the improvement of the Project, please let us know.

(     )

(Thank you for your kind cooperation.)

Please check (✓) the most appropriate answer or write down your comments. Your cooperation would be greatly appreciated and your answers only will be used for this study.

- 90% and more: very satisfied, very agreed
- 80% to 89%: satisfied, agreed
- 70% to 79%: moderate,
- 69% or less: dissatisfied, not agreed
- None: very dissatisfied, very disagreed





#### **4. Questionnaire Survey to Participants in the Training Program**

### **Questionnaire for Ex-Post Evaluation on the Project “Capacity Building for Irrigation Technology in Upper Myanmar”**

#### **Questionnaire to those who participated in training programs**

This questionnaire is designed to evaluate the project “Capacity Building for Irrigation Technology in Upper Myanmar” (hereinafter referred to as “Project”) by the Korea International Cooperation Agency (KOICA).

#### **- BACKGROUND OF RESPONDENT**

- (1) Gender:  male  female
- (2) Position:
- (3) Division (department):
- (4) Month/Year when you joined the office:
- (5) Educational background and Major:
- (6) Please specify your job:
- (7) What training program did you participated?
  - Invitational training program in Korea
  - Training Program by Korean expert in the Facility
  - Other (    )

## 1. Questions about Relevancy

1-1. How appropriate or relevant do you think the training program was as a part of the Project in improving you technical or work capability and knowledge?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

1-2. If none, please explain why:

---

1-3. Did Korean lecturers or experts provide advanced technology and information based on the objective of the Project?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

1-4. Did the training program have appropriate time and contents for meeting the objectives?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

## 2. Questions about Efficiency

2-1. Was the training program sufficient for providing transfer of irrigation and related construction technologies?

Yes ( )      No ( )

2-2. If no, please specify what was deficient:

---

2-3. Was the training program implemented to the target trainees as initially planned?

Yes ( )      No ( )

2-4. If not, please specify the reason:

---

## 3. Questions about Effectiveness and Impact

3-1. How much satisfied were you with the instructors' expertise during the training program?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-2. If none, please explain why:

---

3-3. To what extent were you satisfied with the instructors' teaching skills or methods training program?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-4. If none, please explain what the problem was:

---

---

3-5. Were you satisfied with the textbooks and/or teaching material provided during the training program?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-6. If none, please explain why:

---

3-7. To what extent were you satisfied with the training equipment and or facilities for the training program?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-8. If none, please explain what the problem was:

---

---

3-9. Were you satisfied with the training period and or class size during the training program?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-10. If none, please explain why:

---

---

3-11. To what extent do you think the training program improved the level of your technical knowledge and technology?

- |                   |                  |
|-------------------|------------------|
| (1) 90% and more, | (2) 80% to 89%,  |
| (3) 70% to 79%,   | (4) 69% or less, |
| (5) None          |                  |

3-12. If none, please explain why:

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\* If you have any suggestions for the improvement of the Project, please let us know.

(      )

(Thank you for your kind cooperation.)

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**Ex-post Evaluation Report on the Project for Irrigation Technology Capacity  
Building in Upper Myanmar**

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