Ex-Post Project Evaluation 2015: Package II-4

(Kenya, Tanzania, Uganda, Republic of South Africa, Swaziland)

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Republic of Kenya, United Republic of Tanzania, Republic of Uganda

FY2015 Ex-Post Evaluation of Technical Cooperation Project
"The Project of the African Institute for Capacity Development Phase II and Phase III"

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0. Summary

This project aimed to establish the African Institute of Capacity Development (hereafter, AICAD) in order to conduct training and extension packages based on research that contributes to poverty alleviation and human resources development in collaboration with the member universities and to enhance self-support of AICAD in Kenya, Tanzania and Uganda. Poverty alleviation was consistent with the policy and development needs of the three target countries (i.e. Kenya, Uganda and Tanzania) and Japan's ODA policy. Therefore, relevance of the project is high. In Phase II[1] of the project, although networks with the teaching staff and other important players at the member universities were established, the development and implementation of training and extension packages based on the research results were insufficient. In Phase III, although outputs and project-purpose achievements were enhanced by focussing on extension packages as the target of JICA's support, the relationship with the university teaching staff was weakened. Additionally, the extent of knowledge establishment and skills acquired by the participants through the project's training and extension packages is regarded to be fair for Phase II and relatively high for Phase III. Therefore, effectiveness and impact of the project are fair. Regarding the project costs borne by the Japanese side in Phase II, it is necessary to consider that the input of human resources significantly increased compared to the planning stage, although specific figures related to the planned budget were not mentioned, while effectiveness and impact are fair. In Phase III, the project cost from the Japanese side drastically decreased compared to the planning stage because the planned figure was temporarily set and the substantial area of support from JICA was narrowed down drastically after project commencement. On the other hand, the cooperation period for Phases II and III was shorter than planned. Hence, efficiency of the project is fair. As for sustainability, some minor problems have been observed in terms of the organisational, technical and financial aspects, although no major problems have been observed in the policy background. Thus, sustainability of the project is fair.

In light of the above, this project is evaluated to be partially satisfactory.

[1] This project was implemented from Phase I to Phase III. In this evaluation study, Phase II and Phase III were evaluated integrally as one project.

1. Project Description

Project Locations
(Red star = Headquarters
Blue star = Country Office)

Knowledge and Technology Dissemination Programme (KTDP) in Tanzania
(Food Processing)

1.1 Background

Although poverty alleviation was an important issue for African countries, it was difficult for them to plan and implement various measures to enhance productivity in agriculture, vocational training and so on by themselves. In line with the program announced by the Japanese government at the Tokyo International Conference on African Development II (TICAD II) held at Tokyo in 1998 to support African nations, AICAD was established in 2000 and aimed to develop and conduct training and extension programmes based on research which would contribute to poverty alleviation in collaboration with the member universities, and foster human resources related with them, which the Japanese government supported. AICAD conducted research, training and extension programmes which contributed to poverty alleviation in Kenya, Tanzania and Uganda in collaboration with the member universities in the three countries and was acknowledged as a region-based international organisation during the project implementation period[2].

Japan provided its grant-aid support to construct a facility and provide equipment at the Jomo Kenyatta University of Agriculture and Technology campus in 2003 for AICAD. In terms of the technical cooperation project, during Phase I[3] (2000–2002), the preparatory phase, it was decided to implement the project in substantial phases (Phase II and so on) in Kenya, Tanzania and Uganda in conjunction with the eight universities in those countries and started to establish their basic structure and activities on a trial basis.

During Phase II (2002–2007), research support and the development and implementation of extension packages based on the research results, as well as training packages based on existing

[2] However, in Uganda, it is still in the process of qualification screening as a region-based international organisation at the time of the ex-post evaluation.
[3] In Phase I, the substantial phases of the project cooperation period were expected to last approximately 10 years (JICA internal document).

knowledge, were conducted in collaboration with the 15 member universities in the three countries. However, since the results of the research, training and extension activities during Phase II did not reach the expected level, both sides agreed that JICA's support would be focussed on extension activities which intended to solve problems in local communities in Phase III (2007–2012), and these activities were implemented accordingly. At the completion of Phase III, there were 19 member universities (including one which suspended their membership) in the three countries, a number that had not changed at the time of this ex-post evaluation.

1.2 Project Outline[4]

		Phase II	Phase III
Overall Goal		To be the leading African institution in building human capacity for poverty reduction.	AICAD becomes an independent, region-based international organisation which plays a leading role in building human capacity for poverty reduction in Africa
Project Purpose		AICAD will establish structural and functional modality for effective linkage between knowledge/technology and application.	AICAD will be strengthened at its core functions and organisation, which embody AICAD's comparative advantages for facilitating networking and capacity building for poverty reduction and socio-economic development
Outputs	Output 1	Knowledge and technology packages for poverty reduction are identified and generated.	To ensure sustainability of the following outputs (2–3), the capacity of AICAD Secretariats enhanced, especially in planning and coordinating.
	Output 2	Partnerships for identification, generation and transfer of knowledge and technology (research, training, etc.) within the countries are strengthened.	The networking function of AICAD is strengthened.
	Output 3	Cooperation with other regions for identification, generation and transfer is enhanced (Establishment of partnership with other regions)	AICAD's activities are reinforced to focus on technology dissemination for the communities in order to contribute to poverty reduction.
	Output 4	Identified and generated knowledge and technology translated into appropriate dissemination/extension packages	
	Output 5	Appropriate knowledge and technology are transferred to extension organisations and communities.	
	Output 6	Networks and resource sharing with institutions and communities in participating countries are established	
	Output 7	Target countries for AICAD Phase III are identified and preparations for	

[4] Although some parts of the expression of PDM in English and Japanese versions are not exactly the same, the original expression in each version of PDM was quoted throughout this evaluation report, unless there is no specific reason, because they were already shared among the stakeholders of the project.

		joining are made	
	Output 8	Effective organisational structure is established[5]	
Total cost (Japanese Side)		1,559 million yen	447 million yen
Project Period		August 2002–July 2007	September 2007–June 2012
Implementing Agency		・AICAD－ Headquarters in Kenya and Country Office (hereinafter, CO) in Kenya, Tanzania and Uganda ・Ministry of Higher Education, Science and Technology (Kenya); Ministry of Communication, Science and Technology (Tanzania); Ministry of Education and Sports (Uganda)	
Other Relevant Agencies/Organisations		・Member universities: 8 universities at the commencement of Phase 2 (5 in Kenya, 2 in Tanzania and 1 in Uganda), 19 universities at the completion of Phase 3 (7 in Kenya, 7 in Tanzania and 5 in Uganda, including 1 university in Tanzania, whose membership was suspended)	
Supporting Agency/Organisation in Japan		・Ministry of Education, Culture, Sports, Science and Technology ・Ministry of Foreign Affairs ・AICAD Support Committee in Japan (Kyoto University, Nagoya University and Hitotsubashi University)	
Related Projects		・Technical Cooperation Project: 'African Institute for Capacity Development' (Kenya/Tanzania/Uganda) (2000–2002) ・Grant Aid Project: 'The Project for Construction of African Institute for African Development' (Kenya) (2001–2003) ・ Technical Cooperation Project: 'AFRICA-ai-JAPAN-Project: African Union-African innovation – JKUAT AND PAUSTI[6] Network Project' (Kenya) (2014–2019)	

1.3 Outline of the Terminal Evaluation

The overview of the achievements of the project purpose and overall goal at the terminal evaluation of Phase II and Phase III, as well as recommendations, are as follows.

Table 1 Outline of the Terminal Evaluation (Phase II and Phase III)

	Phase II	Phase III
Achievement of Project Purpose	Although AICAD already have established certain modalities for research & development (R&D) and training & extension (T&E), they have not yet established a functional system of effective collaboration among the divisions.	AICAD have acquired the capacity to mobilise resources throughout the broad range of the university network as a result of conducting various activities in collaboration with the member universities.
Achievement of Overall Goal	Though AICAD are still in their early stage, as they were newly established, they steadily have been accumulating knowledge and technology and are establishing their administration system towards attaining the overall goal.	If AICAD can ensure sustainability from organisational, technical and financial aspects, and maintain their current activities both in terms of quality and quantity, it is highly probable that the overall goal will be achieved within 3 to 5 years.

[5] In the Japanese version of the PDM, Output 8 is described as "Mechanisms for the organization, effective policy, human resources management, governance, resource management and monitoring & evaluation are established."
[6] PAUSTI stands for Pan-African University Science Technology Innovation. PAU is a graduate university that teaches students at master's and doctorate courses from multiple countries throughout Africa, using the facilities, manpower and support from related organisations from the host universities, which are existing universities in Africa. It is based on the 'PAU Plan' formulated by the African Union Committee (AUC) in 2008.

Recommendations	(1) Putting priority of Japanese support on research projects that have potential to be disseminated and promoting the 'AICAD-directed needs–oriented research' support (2) Enhancing follow-ups for the ex-participants of AICAD's training courses by COs (3) Collection and sharing information within the region for Information maintenance & Dissemination and establishing a policy and basic plan for information and communication technology (ICT) (4) Developing an annual operational plan through the revision of the five-year strategic plan (2005) (5) Dividing AICAD activities into two categories: activities funded by the three countries and those financed by external funds; JICA shall support the latter. Defining the role of COs more clearly and empowering them if need be.	【Short-term】 (By the completion of the project) (1) Preparing summary sheets for CEP[7] and UOA[8], and holding a seminar (2) Raising visibility within the governments of the member states 【Medium-term】 (3) Selection and concentration on core competence by further strengthening AICAD's comparative advantages (4) Developing strategic materials and promoting marketing/publicity (5) Garnering more support and cooperation from donors and other development institutions and strengthening partnerships with existing partner organisations (6) HQs' stronger support to COs for scaling up their activities

Source: Based on the Terminal Evaluation Report on Phase II and Phase III

2. Outline of the Evaluation Study

2.1 External Evaluator

Mayumi Hamada, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: August, 2015–October, 2016

Duration of the Field Study: October 25, 2015–December 10, 2015

January 31, 2016–February 13, 2016

2.3 Method of the Evaluation Study

The project was implemented beginning Phase I through the end of Phase III. In this report, Phase II and Phase III, the target periods of this evaluation, were evaluated as one project. In terms of the evaluation criteria, the project's relevance and sustainability, which are regarded to be highly common and successive between Phase II and Phase III, were evaluated together (as for the project's sustainability, emphasis was put on Phase III in terms of information collection

[7] CEP stands for Community Empowerment Programme. It is one of the extension programmes developed by the project and was the major area of JICA's support in Phase III. It is a programme in which various types of interference, such as technical guidance, visits to related stakeholders, provision of small equipment and so on, are made simultaneously to community groups in the model area, which was selected in advance. CEP was planned and implemented using a participatory approach with people from each community.

[8] UOA stands for University Outreach Activity. It means outreach activities by universities to contribute to society.

and analysis).

On the other hand, priority programmes and the types of activities varied throughout both phases, and the budgetary scale for each phase significantly differs from the other. Thus, the effectiveness and efficiency of both phases were evaluated separately. Additionally, achievements of each phase were assessed respectively; the relationship between the phases, contributing/hindering factors of the achievement and complementary effects that emerged were sufficiently comprehended, followed by assessing each evaluation criterion throughout both phases.

3. Results of the Evaluation (Overall Rating: C[9])

3.1 Relevance (Rating: ③[10])

3.1.1 Relevance to the Development Plan of Kenya, Tanzania and Uganda

Poverty alleviation has been one of the major policy issues in the African region. At the time of the ex-ante evaluation of Phase II, three participating countries had established poverty reduction strategy papers (PRSP), respectively, and conducted programmes accordingly. The three nations continuously made efforts to alleviate extreme poverty and achieve millennium development goals (MDGs) of the United Nations, launching policies to enhance agricultural productivity through the extension of appropriate technology, such as the 'Investment Programme for the Economic Recovery Strategy for Wealth and Employment Creation' (2003–2007) in Kenya, the 'National Strategy for Growth and Reduction of Poverty' (NSGRP) (2005–2010) in Tanzania and 'Poverty Eradication Action Plan' (PEAP) (2004–2007) in Uganda. Later, these policies were taken over by policies such as 'Vision 2030' (2007–2030) in Kenya, 'The Tanzania Five Year Development Plan' (2011–2015) in Tanzania and the 'National Development Plan' (2010–2014) in Uganda. However, the policy direction towards poverty reduction was maintained until the project completion of Phase III. The project intended to establish a mechanism to enhance human resources development and capacity development to contribute to poverty reduction. Hence, the project had been highly consistent with the development plan of the three nations throughout Phase II and Phase III.

3.1.2 Relevance to the Development Needs of Kenya, Tanzania and Uganda

The project aimed to address social and economic development to contribute to poverty reduction. On the other hand, nominal gross national income (GNI) per capita of the three countries remained low in world ranking at the end of the cooperation period, although it increased in each country compared to 2002 (when Phase II started), 2007 (when Phase II ended) and 2012 (when Phase III ended; Table 2). Hence, tackling the poverty alleviation issue

[9] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[10] ③: High, ②: Fair, ①: Low

had been important for the target countries from the commencement of Phase II until the completion of Phase III. Therefore, the project's direction had been consistent with the development needs of the three countries.

Table 2: Nominal GNI

Country	Nominal GNI per person (Unit: U.S. Dollar)			Ranking		
	2002	2007	2012	2002	2007	2012
Kenya	394	718	929	179	179	180
Tanzania	310	530	682	185	188	188
Uganda	308	419	599	187	197	195

Source: GLOBAL NOTE http://www.globalnote.jp/post-1353.html

3.1.3 Relevance to Japan's ODA Policy

At TICAD II and the Birmingham Summit held in 1998, the Japanese government announced its support of actualising the base network conception ('Bases for African Human Capacity Building' [which was renamed AICAD later] and 'Centers for Parasitic Disease Control') and promoting regional cooperation (South-South cooperation) in collaboration with African countries. Additionally, human resources and agricultural development were two of the five priority areas in the Country Assistance Program for Kenya, which was formulated in August 2000. In the human resources development areas especially, one of the four priority issues was 'higher and technical education', which indicates a desire for the establishment of network bases in human resources development. Furthermore, the Country Assistance Program for Tanzania, which was established in June 2000, indicated that 'support for promoting agriculture and small enterprises' was one of the five priority areas. At the time of the ex-ante evaluation of Phase III, the project matched with the Japanese aid policy, including support towards the TICAD process as well as the priority area of the JICA Country Assistance Program. Thus, the project direction was highly consistent with the Japanese aid policy in both phases.

This project was highly relevant to the three countries' development plan and development needs, as well as Japan's ODA policy. Therefore, its relevance is high.

3.2 Effectiveness and Impact[11] (Rating:②)

3.2.1 Effectiveness

3.2.1.1 Phase II

Regarding the achievement of the eight outputs in Phase II, only one was 'high', four 'fair' and three 'low'. Thus, achievement of the outputs as a whole is medium (Table 3).

Additionally, concerning the five indicators of the project purpose, Indicators 2, 4 and 5 were redefined based on the document review and interviews with those who were concerned with the project because of the problems shown below. As a result, Indicator 2 was not used as an indicator. Among the remaining four indicators, the achievement of one indicator was 'high', one 'fair' and one 'low'. For another indicator, no data existed (Table 4). Hence, achievement of the project purpose is assessed as medium.

- Indicator 2 (criteria for expansion to be reflective of participative approaches): this indicator was not used because what it meant was not clear.
- Indicator 4 (Number of identified and generated knowledge & technology packages adopted by target communities): based on the interviews with those who were concerned with the project, this indicator was interpreted as 'the number of identified and generated knowledge and technology packages applied (committed to by the target to use them) in the project sites where the project conducted extension activities.'
- Indicator 5 (Number of adapters of the knowledge and technology identified and generated by AICAD): based on the interviews with those who were concerned with the project, this indicator was interpreted as 'the number of people who use the knowledge and technology identified and generated by AICAD outside the project sites.'

By supporting research projects implemented by teaching staff at the member universities and developing and implementing training and extension packages[12] which will contribute to poverty reduction based on the research results, this project aimed to establish an organisation which can appropriately plan, operate and manage activities, involving various related institutions. During Phase II (Phase I was a preparatory phase), the project supported formulating basic internal documents concerned with personnel management, accounting systems and the like within AICAD. It also promoted establishing basic infrastructure, such as concluding partnership agreements, and supported AICAD to be accepted as a region-based

[11] Sub-rating for Effectiveness is to be put with consideration of Impact.

[12] The training package here means a framework for training (objective, contents, expected targets, trainers, necessary equipment, etc.), curriculum and teaching materials. Likewise, the extension package means a set of documents, such as the framework of the extension (objective, contents, expected targets, target area, trainers, facilitators and necessary equipment, etc.), programmes, schedule and documents, related to the establishment of the structure/mechanism.

Table 3: Achievement of Outputs by the Completion of Phase II (June 2007)

Output	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
Output 1: Knowledge and technology packages for poverty reduction are identified and generated. （×）	①	Number of new knowledge and technology packages identified and generated	As the result of support for 119 research projects, 25 were identified as having potential for extension.	×
	②	Number of existing knowledge and technology packages identified	The number of knowledge and technology packages identified based on existing knowledge and technology was 8 for training and 0 for extension.	×
Output 2: Partnerships for identification, generation and transfer of knowledge and technology (research, training, etc.) within countries are strengthened.（○）	①	Number and type of partnership agreements on knowledge and technology with institutions within the region	AICAD concluded partnership agreements on research and training with 20 institutions in the 3 countries.	○
	②	Number and type of existing partnership (e.g. MOUs, records of discussion and registration, etc.) with institutions in the participating countries	AICAD concluded partnership agreements on research and training with 20 institutions in the 3 countries.	○
	③	Others (not mentioned as an indicator, but added to be reflected into the assessment of Output 2 in consideration of its content)	229 teaching staff from the member universities and 252 staff from 146 organisations, i.e., the ministries, local governments, research institutes, training institutes and non-government organisations and so on, were involved as the trainers of AICAD programmes.	○
Output 3: Cooperation with other regions for identification, generation and transfer is enhanced (Establishment of partnership with other regions). （△）	①	Number and type of partnership agreements with institutions outside the region.	AICAD concluded a partnership agreement with 24 institutions (universities in Japan, Thailand and Indonesia; international organisations, such as UNCRD; bilateral donors, such as TICA of Thailand and so on) outside the region (the 3 countries).	△
	②	Number and type of partnership introduced in existent partnership with institutions outside the region		
	③	Number of collaboration programmes	N/A	N/A
	④	Number of participating institutions in the collaboration programmes	N/A	N/A
Output 4: Identified and generated knowledge and technology are translated into appropriate dissemination/extension packages. （×）	①	Amount of knowledge and technology translated into appropriate dissemination/extension package	3 knowledge and technology dissemination programmes (hereafter, KTDPs[13]) were developed during Phase 2, based on the results of research projects, for which 118 research projects were funded.	×
Output 5: Appropriate knowledge and technology are transferred to extension organisations and communities. （△）	①	Number of trainees (This indicator was modified from 'the number of extension organisations trained' by terminal evaluation team)	A total of 1,314 people, including extension workers, farmers and business people, were trained through AICAD training courses which were developed by Output 4 (Regional training: 221; In-country training: 644; Grassroots training[14]: 449). Among the 3 extension packages developed, 1 of them started its activities before completion of Phase II ('Improving sesame production and utilization in low to medium rainfall areas of Western Kenya' in Kenya), while other 2 started the extension activities in Phase III.	○

[13] It means "knowledge and technology dissemination programme based on the research result." KTDP was one of the extension packages implemented by the project. AICAD developed and implemented this extension package based on the results of research supported by AICAD.

[14] "The Grassroots Training" of this project is a training course for which the program is designed on request basis and implemented with participation of specific group in order to address needs of specific areas. Some of the ex-participants of the In-country Training courses were expected to become trainers for the Grassroots Training courses. It was actually observed at the time of ex-post evaluation that some ex-participants of the In-Country Training were actually received as the trainers at the Grassroots Training.

	②	Number of communities trained	N/A	N/A
	③	Other (not mentioned as an indicator but added because an indicator for extension, which should have been included to assess technical transfer, was lacking)	Regarding technology transfer through the extension package, there was only 1 KTDP package, for which extension activities started during Phase II.	×
Output 6: Networks and resource sharing with institutions and communities in participating countries are established. （△）	①	Database sharing systems with other concerned organisations set up	Among the 3 modules of the Poverty Alleviation Information and Knowledge System (hereafter, PAIKS), Module 1 (research results) and Module 2 (training resource) were completed, while Module 3 (community information) had not been completed by the project's completion nor at the time of ex-post evaluation.	×
	②	Numbers and types of shared resources with other organisations	At the time of the terminal evaluation of Phase II, the number of materials for Module 1 (research result) was 730 and for Module 2 (training resource) 1,594. The data on the materials from terminal evaluation to the project completion were not available.	○
	③	Volume of information accumulated in the database	Volume of information accumulated in the database was 2.7 GB.	△
	④	Number of access to the database from outside organisations	The number of accesses to the database from outside was 2,635 (from December 2005 to October 2006). The number of accesses to the database from outside after October 2006 was not obtained.	○
Output 7: Target countries for AICAD Phase III are identified and preparations for joining AICAD are made. （×）	①	Number and names of potential target countries meeting set criteria	The selection of the potential target countries and preparations for their entry in AICAD have not been implemented because the activities under this plan were changed to be evaluated in 2009 as a part of the AICAD strategic plan.	×
Output 8: Effective organisational structure established. （△）	①	Improvement and the existence of the documents on organisational structure, policies, human resource systems and management, governance, resource mobilisation and monitoring and evaluation	The organisation chart and the governance structure are described in the AICAD charter. The operation and management procedure of AICAD were shown in the a) administrative manual, b) terms and conditions of services and regulation and c) financial regulations manual and implemented accordingly. On the other hand, communication between HQs and COs and establishment of structure for monitoring and follow up were insufficient.	△

Source: Produced based on the document review, interview and questionnaire

Remarks: The marks in the column 'Level of Achievement' mean the following.

○ High; ○/△ Relatively high; △ Medium; × Low; －Not applicable

Table 4: Achievement of Project Purpose by the Completion of Phase II (June 2007)

Project Purpose	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
AICAD will establish a structural and functional modality for effective linkage between knowledge/technology and application. （△）	①	Level of involvement of intermediaries and communities in identification, generation and transfer of knowledge and technology	The researchers conducted 119 research projects, and 229 teaching staff from the member universities, as well as 252 staff from 146 institutions such as ministries, local governments, research institutes and non-government organisations participated in the training as the trainers. So, the level of involvement of intermediaries is high. Also, the foundation of the structure was built (e.g. some of the ex-participants of in-country training became trainers for the grassroots training).	○
	②	Criteria for expansion to be reflective of participative approaches	This indicator was not used, because what it meant was not clear.	－
	③	Improvement of institutional capacity related to knowledge and technology	Certain approaches were established to implement research and development, and training and extension.	△

		generation, translation and transfer to community linkage	On the other hand, a functional mechanism has not been established to link each division with each other effectively for the generation, translation and transfer of knowledge and technology.	
	④	Number of identified and generated knowledge and technology packages adapted by target communities (based on the interviews with the former Experts of the project, this indicator is interpreted as 'the number of identified and generated knowledge and technology packages applied and committed to by the target to use them in the project sites where the project conducted extension activities')	There were 2 packages which were applied (or committed to by the target to use the knowledge and technology) in the project sites by the project completion of Phase II. Also, 1 ('Improving sesame production and utilization in low to medium rainfall areas of Western Kenya' in Kenya) of the 3 extension programmes (KTDP) developed based on the research results started its activities during the same phase.	×
	⑤	Number of adopters of the knowledge and technology identified and generated by AICAD (Based on the interviews with former Experts of the project, this indicator is interpreted as 'the number of people who use the knowledge and technology identified and generated by AICAD outside the project sites')	N/A	N/A

Source: Produced based on the document review, interview and questionnaire
Remarks: The marks in the column 'Level of Achievement' mean the following.
○ High; ○/△ Relatively high; △ Medium; × Low; －Not applicable

international organisation. At the same time, the project conducted a variety of activities, such as research, training and extension programmes in the three countries in collaboration with 19 member universities. On the other hand, it did not establish a functional mechanism to effectively link each division with the others for the generation, translation and transfer of knowledge and technology. As a result, the achievement of the project purpose (i.e. establishment of the mechanism of AICAD to 'effectively link knowledge/technology and application') remained medium. In Phase II, 25 research results were identified as having potential for extension, which was limited, in spite of 119 research projects supported by the project. Consequently, it did not sufficiently reach the expected result of 'practical research results which can be converted into training and extension packages to contribute to community poverty reduction.' Thus, the number of packages which were actually developed[15] during Phase II was three out of 119 research projects, which was small. As a result, the activities for 'training and extension based on the research result for the sake of poverty alleviation' at the initial plan did not expand much, because of the small number of extension packages already developed, resulting in insufficient improvement of AICAD's organisational management capacity. As for the training packages, eight courses[16] were developed based on the existing

[15] In Phase II, 3 extension packages were developed: 'Ceramics' in Uganda, 'Semi-Prefab Concrete Construction Techniques for Urban Low Cost Housing' in Tanzania and 'Improving sesame production and utilization in low to medium rainfall areas of Western Kenya' in Kenya. In Phase III, another 3 extension packages were developed, which were 'Sustainable use of papyrus' and 'Piggery Training' in Uganda and 'Cassava Cultivation and Utilization in Rongo District' in Kenya.

[16] The 8 training courses were 1) African training course, 2) rural women (training of trainers), 3) irrigation and water resource management course, 4) indigenous vegetables, 5) enterprise development course, 6) value addition

knowledge and technology, undertaken in parallel with the research support activities. The number of participants totalled 1,314, with 644 for the in-country training courses, 221 for the regional training courses and 449 for the grassroots training courses.

Therefore, the effectiveness of Phase II is fair based on the reasons stated above.

3.2.1.2 Phase III

As for the achievement of the three outputs of Phase III, two of them were 'high' and one was 'medium'. Hence, achievement of the outputs as a whole is assessed to be relatively high (Refer to Table 5).

Regarding the project purpose, among five indicators, Indicator 5 (Activities for poverty alleviation are planned and implemented in collaboration with resources of member universities) overlaps with Output 2 and Output 3. Hence, Indicator 5 was not used to assess the project purpose. Since the achievement of the rest of the four indicators was medium, achievement of the project purpose is medium (Refer to Table 6).

In light of the Phase II results, JICA shifted their support policies in Phase III from training and extension based on research results to those based on existing knowledge and technology without sticking to the research results. Thus, research was excluded from major target of JICA support in Phase III, except for research that was required for the "New rice for Africa" (hereafter, NERICA) dissemination programme. Additionally, the scale of support drastically shrank compared to Phase II. Specifically, although the training courses by COs in Tanzania and Uganda were conducted mostly as planned, the KTDPs, the 'extension programmes based on research results' developed during Phase II, faced some problems during the implementation stage: some programmes needed to be modified significantly to customise the technology to match the local uniqueness of each target area, and the transfer of knowledge and technology tended to be one way without sufficient discussion with the communities. Consequently, the project developed the Community Empowerment Programme (hereafter, CEP)—an extension programme which combined training, extension and small-scale equipment provision targeting specific areas, although it is based on existing knowledge and technology. The activities were conducted with focusing on this programme. Although the scale of support was smaller than in Phase II, the achievement of Phase III was favourable compared to Phase II. However, the achievement of the project purpose (i.e. AICAD will be strengthened in their core functions and organisation, which embody AICAD's comparative advantages to facilitate networking and capacity building for poverty reduction and socio-economic development) remained medium. This is because the achievement of Output 1 (i.e. enhancing AICAD's capacity [planning and coordination]) was medium and did not contribute much to achieving the project purpose, whereas the achievements of Output 2 (i.e. the networking function of AICAD with the

course, 7) HIV/nutrition course and 8) dry-land crops.

university teaching staff who are interested in extension and training is strengthened) and Output 3 (AICAD's activities are reinforced to focus on technology dissemination for the communities) were high. Thus, the effectiveness of Phase III is fair.

Table 5: Achievement of Outputs by the Completion of Phase III (June 2012)

Output	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
Output 1: To ensure sustainability of the following outputs (2–3), the capacity of the AICAD Secretariat is enhanced, especially in planning and coordinating. （△）	①	Introduced and established a system to secure the relevant management of AICAD	GB meetings were carried out smoothly for effective decision-making, which resulted in smooth operation of AICAD.	○
	②	Established process of formulating UP by the AICAD Secretariat	At the time of terminal evaluation, the AICAD Secretariat had improved its capacity to formulate UP without being supported. On the other hand, AICAD needs to improve the contents, as other donors' support has not been acquired.	△
	③	Implementation of activities based on the annual plan prepared by the AICAD Secretariat	The AICAD Secretariat intends to share information between HQs and COs by formulating an 'AICAD almanac'. However, there are some issues, such as insufficient examination of the feasibility of activities and insufficient discussion among those who are concerned with formulating process.	△
	④	Implementation of Country Program Review (CPR) by CO	CPR was conducted before the mid-term review in the 3 countries. Some tasks to be tackled in the remaining project period were shown, and some guidance was given for marketing-oriented approaches in the KTDPs, etc. However, CPR has not been conducted since then.	△
	⑤	Number of GB, committees and Annual Members Forum (AMF) meetings	The GB meetings, meetings of the Finance and Planning Committee, Human Resource Management and Administration Committee and AMF (where the member universities exchange views) were held almost as planned. On the other hand, the Management Committee meetings, which the management staff members of HQs and country directors of COs attend, were postponed or cancelled frequently.	△
	⑥	Strengthened supporting and coordinating function of HQs	Although HQs' support of COs improved through actions such as visits to COs by HQs staff, standardisation of email procedure, information management and monitoring of activities were still insufficient.	△
	⑦	Increase in use of AICAD facilities	Although more efforts need to be made in marketing and publicity, the use rate of the AICAD facilities gradually improved compared to 2008. However, the use rates of the assembly hall and seminar rooms are low, under 20%.	△
	⑧	Means of income generation through implementation of training courses	The "fact sheets" are created by COs and are in the finalisation process so that they can attract external funds. Although there have been some attempts to collaborate with and mobilise financial resources from other donors to organise training courses, AICAD has not clarified the means of securing revenue sufficient for their self-reliance.	△
	⑨	Training materials, manuals, guidelines made by HQs	The AICAD HQs made teaching materials for regional training, such as those for the export trade and NERICA rice cultivation manuals, as well as those developed in collaboration with World Bank Institute (WBI) and Wetlands International Africa (WIA). These materials were used for knowledge dissemination.	○
	⑩	Training materials, manuals, guidelines made by COs	COs developed 7 training materials in total for in-country training courses which were used for those courses.	○
	⑪	Tools and materials for public relations	Fact sheets were prepared, newsletters were published and a website was developed as the means of public	△

			relations. However, the low frequency and quality of publication due to the absence of a library technician are challenges. In addition, these publications were underused and not made for public purposes.	
Output 2: The networking function of AICAD is strengthened. （○）	①	Number of forums, seminars and/or workshops held at HQs	Since 2010, university outreach activity (UOA) symposiums, etc. were held 5 times in total, and 242 people participated. AICAD supported the implementation of four 6-month pilot UOAs based on proposals from universities.	○
	②	Number of HQs' activities in collaboration with member universities	Same as the above (UOA symposiums in Kenya were organised by HQs.	○
	③	Number of COs' activities in collaboration with member universities	48 COs' activities related to training, extension and awareness-raising of universities, etc. were implemented in collaboration with the member universities in the 3 countries.	○
	④	Number of HQs' activities in collaboration with relevant organisations	5 regional training courses (among them, 4 courses were organised in collaboration with the WBI and WIA) and 2 UOAs in Kenya were implemented.	△
	⑤	Number of COs' activities in collaboration with relevant organisations	There were 52 activities, which showed a drastic increase compared to the situation before the commencement.	○
Output 3: AICAD's activities are reinforced to focus on technology dissemination for the communities in order to contribute to poverty reduction. （○）	①	In-country training courses held by COs	28 in-country training courses were held by COs in the 3 countries, and 887 people attended in total.	○
	②	Grassroots training courses held by COs	13 grassroots training courses were held by COs in the 3 countries, and 537 people in total participated.	○
	③	CEP by COs	6 CEPs were implemented by COs in the 3 countries, and a total of 178 people and 114 households participated. The CEP was planned using a participatory planning approach in the target communities and were implemented accordingly.	○
	④	The KTDPs by COs	6 KTDPs were implemented by COs in the 3 countries. Direct beneficiaries of the KTDPs were 50 people and 260 households. Tanzanian communities and the building construction sector also were regarded as direct beneficiaries. Although there were a few cases in which technology was disseminated to communities effectively, AICAD came to recognise that the approach of the KDTP was not so effective as the result of the problems found during implementation.	△
	⑤	Regional training held by HQs	5 regional training courses (the names of courses are the same as in Indicator 4) were held by HQs, and a total of 146 participants attended.	○
	⑥	Dissemination of NERICA	The NERICA rice dissemination activities in Kenya and Tanzania (Zanzibar) were implemented, and 4 varieties in Kenya and 3 varieties in Zanzibar were registered. Furthermore, HQs conducted NERICA training for agricultural extension workers in Kenya. As a part of NERICA dissemination program, 16 empirical research projects were implemented.	○
	⑦	Training and/or seminars co-sponsored by other organisations	4 co-sponsored regional training courses with the WBI and WIA were held by AICAD HQs (this figure is also included in the data of Indicator 5, the number of regional training courses held by HQs).	○
	⑧	Training module	The training modules for 4 areas were being developed by each CO and were scheduled to be completed by the completion of Phase III, according to the Terminal Evaluation Report. The training modules in Uganda completed in July 2011, in Tanzania in October 2011 and in Kenya in May 2012. Hence, all of them were completed by the time of project completion.	○

Source: Produced based on the document review, interview and questionnaire
Remarks: The marks in the column 'Level of Achievement' mean the following.
○ High; ○/△ Relatively high; △ Medium; × Low; －Not applicable

Table 6: Achievement of Project Purpose by the Completion of Phase III (June 2012)

Project Purpose	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
AICAD will be strengthened in its core functions and organisation, which embody AICAD's comparative advantages, to facilitate networking and capacity building for poverty reduction and socio-economic development. (△)	①	AICAD's organisation system (governance) is strengthened.	AICAD's organisation system was strengthened compared to Phase II because the formulation and implementation of UP and organising of GB meetings on regular basis were done in accordance with the established procedures. On the other hand, the frequency of Management Committee meetings was insufficient.	△
	②	AICAD's planning/ coordination capacity is strengthened. (This indicator is regarded to be overlapping with Indicators 1, 2, 3, 5 and for Output 1, i.e., enhancement of AICAD's capacity. As the project purpose was set based on the concept of 'in which state AICAD should be after completion of support in order to be self-supporting', this indicator is understood as 'AICAD can plan and coordinate necessary tasks alone.)	AICAD's planning/coordination capacity was strengthened through their experience with planning UPs and promoting collaboration with various institutions. On the other hand, it is necessary for AICAD HQs to further strengthen their support and coordination function for COs and take necessary actions so that COs can expand their activities in collaboration with many institutions at a national level and enhance their presence among the development community.	△
	③	Measures for economic self-reliance are formulated.	AICAD had begun recognising that strengthening marketing and being fully conscious of ordering side when conducting training and making proposals to other organisations would lead to economic self-reliance. On the other hand, it would take time for economic self-reliance to be assured (Terminal Evaluation Report).	△
	④	Coordination with member universities is strengthened, activities are strengthened and activities involved with them are enhanced. (This indicator was corrected to be 'The collaboration with the member universities is strengthened by implementing activities with their involvement' and analysed accordingly.)	UOA activities were activated in the latter half of Phase III. The teaching staff at the member universities who were interested in and willing to be involved in CEPs and the KTDPs were directly engaged with community activities as resource persons, which led to strengthening collaboration between AICAD and those teaching staff. On the other hand, looking at the whole member universities and the teaching staff, most of the teaching staff and the universities were more interested in research, thus resulting in their decreased interest in AICAD activities as the result of focussing its support on training and extension programmes.	△
	⑤	Activities for poverty alleviation are planned and implemented in collaboration with resources of member universities.	Indicator 5 was not used as an indicator of the project purpose, since it was already covered by Output 2 and Output 3.	—

Source: Produced based on the document review, interview and questionnaire
Remarks: The marks in the column 'Level of Achievement' mean the following.
○ High; ○/△ Relatively high; △ Medium; × Low; —Not applicable

Table 7: Achievement of Overall Goal Three Years after Completion of Phase II (June 2010)

Overall Goal	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
To be the leading African institution in building human capacity for poverty reduction. （△）	①	Number of successful human-resource-based poverty reduction programmes compared to other institutional organisations in Africa (Since criteria to judge 'successful' and the specific meaning of 'other institutional organisations' were unclear, this indicator was judged to be hardly usable for assessment. So 'the number of successful programmers' was redefined as 'the number of established knowledge and technology 3 years after being disseminated by the project.'	Only one extension programme, a KTDP ('Improving sesame production and utilisation in low to medium rainfall areas of Western Kenya' in Kenya) started its activities in Phase II. In Phase III, its activities were continued, and 90 households of farmers cultivated sesame. Being affected by the programme, 34 households of farmers who lived outside the target area started sesame cultivation anew. As for the knowledge and technology established in communities through training, 57% of the respondents replied that they conducted surface irrigation after receiving the training, 33% conducted trickle irrigation and more than 50% answered that their agricultural income increased after the training in the monitoring survey conducted with 117 ex-participants of the irrigation and water management course, an in-country training in Uganda. Thus, certain levels of knowledge and technology were established as the effect of this course.	△

Source: Produced based on the document review, interview questionnaire
Remarks: The marks in the column 'Level of Achievement' mean the following.
○ High; ○/△ Relatively high; △ Medium; × Low; －Not applicable

Table 8: Achievement of Overall Goal of Phase III at the Time of the Ex-Post Evaluation (2016)

Overall Goal	Objectively Verifiable Indicators		Achievement	Level of Achieve-ment
AICAD becomes an independent, region-based international organisation which plays a leading role in building human capacity for poverty reduction in Africa. （○）	①	AICAD activities are sustainably implemented. (This indicator implies only the continuation of activities, which is hardly usable for an indicator to assess achievement of an objective. The overall goal itself describes mere continuation of activities and is too vague for an objective. Thus, this indicator was redefined, like Phase II, as 'the number of knowledge and technology disseminated/trained, which remains to be established at the time of ex-post evaluation'.	A record of monitoring establishment of knowledge and technology in the region or the area where those extension/training activities were conducted does not exist. According to the beneficiary survey conducted with the ex-participants of 6 CEPs and 5 grassroots training courses, the establishment of knowledge and technology was reached to a certain extent. Thus, achievement of the overall goal of Phase III is assessed to be relatively high.	○/△

Source: Produced based on the document review, interview and questionnaire
Remarks: The marks in the column 'Level of Achievement' mean the following.
○ High; ○/△ Relatively high; △ Medium; × Low; －Not applicable

Although both phases aimed AICAD's strengthening of the organisation[17] as the project purpose, the achievement was medium. In Phase III, however, improvement of AICAD in their planning and coordination capacity (Output 1) [18] was observed in their operation of routine

[17] 'Strengthening of the Organisation' means that AICAD is able to plan, implement, monitor and evaluate activities required in each phase by themselves through capacity development and establishment of their internal and external structure. 'The organisational management capacity' mentioned on the previous page means the capacity enhanced through 'organisational development'.
[18] 'The planning and coordination capacity' means the capacity mentioned by the 11 indicators for Output 1 of Phase III (Refer to Table 5). In this ex-post evaluation study, this capacity was understood as a part of 'the organisational management capacity' expected to be enhanced by 'strengthening of the organisation', based on which analysis was made.

activities, such as formulating and implementing a unified programme (UP) and organising governing board (GB) meetings on a regular basis in accordance with the procedures already established. This improvement shows effects brought by the long-term support to AICAD by JICA to some extent. Although the project did not result in many research results that were convertible to training and extension packages which could contribute to poverty alleviation of communities within a short period in Phase II, it could smoothly implement and operate training and extension programmes developed based on existing knowledge and technology in Phase III. Since JICA's major support was focussed on training and extension programmes, excluding research in Phase III, the number of teaching staff who were involved in the project activities decreased compared to Phase II, although the relationship between the project and the teaching staff who were interested in training and extension programmes was deepened. Furthermore, from the viewpoint of all member universities, most of the teaching staff and the universities were more interested in research, thus resulting in their decreased interest in AICAD activities. As a result, collaborative relationship of AICAD with the teaching staff of the member universities, who have stronger interest in research, was weakened as will be explained later (Impact of Phase III, 2) Achievement of Outputs and Project Purpose).

Therefore, effectiveness throughout both phases is fair.

3.2.2 Impact

3.2.2.1 Phase II

(1) Achievement of Overall Goal

1) Achievement of the Overall Goal

The indicator (number of successful human resource–based poverty reduction programmes compared to other institutional organizations – AFRICA) for the overall goal (to be the leading African institution in building human capacity for poverty reduction) has some problems; for example, the criteria for judging being 'successful' and the specific meaning of 'other institutional organizations – AFRICA' are too vague to use as an indicator. Thus, this indicator was redefined from 'the number of successful programmes' to 'the number of established knowledge and technology three years after being disseminated' (Table 7).

With regards to the achievement of the overall goal of Phase II three years after completion, the number of extension programs that started their activities by the end of Phase II was small, i.e. only one, since the number of extension packages developed based on the research results by the end of Phase II was only three. On the other hand, the knowledge and technology transferred via some training courses were established among the participants after training, such as Irrigation and Water Management Course, an in-country training course in Uganda. The ex-participants of the course replied that the training also contributed to increasing income. Although it may not reflect the whole situation due to limited information, it is regarded that

some training courses produced effects to a certain extent.

The development of training and extension packages based on research results has been delayed because not enough research results were achieved that were convertible to those packages. On the other hand, some of the training courses based on existing knowledge and technology showed high levels of the establishment of knowledge/technology among the ex-participants even after three years, such as Irrigation and Water Management Training Course, the in-country training in Uganda. Thus, the achievement of the overall goal of Phase II is assessed to be medium.

2) Achievement of Outputs and Project Purpose (Three Years after Project Completion)

6 KTDPs (Output 5), the extension program based on research results, were conducted in Phase III in the three countries, including the one that began its activities during Phase II. The clarification of the KTDP's framework and the selection of candidates for implementation were almost completed during Phase II, which led to a smooth start for the activities in Phase III. However, situations in which the research results could not be applied at the project site occurred frequently, while there was a good practice (such as Piggery Training in Uganda). The project was emphasised to drastically change the technology so as to customise it to match the indigenous characteristics of each target area after commencement of the KTDP. Also, a defect of the program that emerged was that the one-way transfer of knowledge and technology tended to be done without having sufficient opportunities to discuss this knowledge and technology with the communities, which led to difficulty in fostering ownership of the communities. Furthermore, progress management was difficult due to the lack of structure established for monitoring. As these weaknesses of the KTDP emerged, the people concerned with the project realized that the KTDP's approach was not effective in the project. Hence, the project stopped sticking to development and implementation based on the research results, and a new extension program (CEP) was developed that intensively addressed poverty alleviation in a model area by combining multiple schemes of support, focusing its support on the CEP.

Meanwhile, monitoring and follow-up after the project's completion have not been conducted sufficiently due to a lack of funds.

(2) Other Impacts

1) Indirect Positive/Negative Impacts

① Impacts on the Natural Environment: None

② Land Acquisition and Resettlement: None

③ Other Indirect Impacts: Many of the training and extension programs conducted in Phase II were done continuously in Phase III as well. Thus, the status of the use of the knowledge and technology acquired, the change of income, the influence on the empowerment of women and

so on will be analysed together with the impact of Phase III.

No negative impact was observed.

With the reasons stated above, the impact of Phase II is fair.

3.2.2.2 Phase III

(1) Achievement of Overall Goal

1) Achievement of Overall Goal

The indicator (AICAD activities are sustainably implemented) for the overall goal (AICAD becomes an independent, region-based international organisation that plays a leading role in building human capacity for poverty reduction in Africa) means only the continuation of activities, which is hardly usable as an indicator for assessing the achievement of an objective. The overall goal itself describes merely the continuation of activities and is too vague for an objective. Thus, this indicator was redefined, like Phase II, as 'the number of knowledge and technology disseminated/trained, which remains to be established at the time of the ex-post evaluation,' based on which analysis was made (Table 8).

A record of monitoring the establishment of knowledge and technology in the region, or the area where extension/training activities were conducted, does not exist. To collect this information, interviews based on a questionnaire were conducted with the ex-participants of six CEPs and five grassroots training courses, as a beneficiary survey[19], in this ex-post evaluation in the three countries. The result is as follows.

The replies from the respondents to the question 'Are you still utilizing the knowledge and/or skills you acquired through the training/CEP activities now?' were as follows. On a five-point rating scale, 104 out of the total number of respondents, i.e., 135 (77%) of six CEPs selected either 'Yes, very much' (5) or 'Yes' (4), while 37 out of 64 respondents of five grassroots training courses chose either 'Yes, very much' (5) or 'Yes' (4) (Table 9). In terms of each of the CEPs, more than half of the respondents in every CEP replied with either 'Yes, very much' (5) or 'Yes' (4). Hence, it is determined that the knowledge and technology disseminated through the six CEPs are mostly established. Among the six CEPs, 'Improving livelihoods in Kakindu Sub-county through building capacity for soil and water conservation and agroforestry' in Uganda showed the highest results in terms of the establishment of knowledge and technology, with 18 out of 20 respondents selecting either (5) or (4) on the five-point rating.

[19] The sample size was 152 (88 participants of six CEPs and 64 participants of five grassroots training courses in the three countries). However, the total number of respondents is different from the sample size, because many of the participants of CEPs join more than one CEP in Kenya. The sample was selected according to nonrandom selection based on representatives' introduction of the target communities or groups.

Table 9: Are You Still Utilizing the Knowledge and/or Skills You Acquired through CEP Now?

(Unit: person)

No	Country	Name of Programme	5	4	3	2	1
1	Kenya	Integrated Irrigation Farming Project	4	17	4	1	1
2	Kenya	Water Harvesting and Management Project	5	16	7	2	2
3	Kenya	Livestock Production Project	4	15	6	3	1
4	Uganda	Improving Livelihoods in Kakindu Sub-county through Building Capacity for Soil and Water Conservation and Agroforestry	14	4	2	0	0
5	Uganda	Promotion of Income Generation among Persons with Disability in Butayunja Sub-county	8	11	0	1	0
6	Tanzania	Empowering Women for Poverty Reduction (Food Processing)	2	4	1	0	0
Total			37(23)	67(38)	20(6)	7(4)	4(4)

Remarks 1 The number of each rating shows the following.
5: Yes, very much 4: Yes 3: Medium 2: Not so much 1: Not at all
Remarks 2 The number shown in parentheses indicates the number of women included in the total respondents.
Remarks 3 In Kenya, the total number of the actual respondents is different from the numbers shown above, as some residents participated in more than one CEP.

Table 10: Are You Still Utilizing the Knowledge and/or Skills You Acquired through GRT Now?

(Unit: person)

No	Country	Name of Training	5	4	3	2	1
1	Kenya	Rural Women Empowerment	0	1	3	14	0
2	Uganda	Rural Women Empowerment	10	1	0	0	2
3	Tanzania	Food Processing Training Course for Morogoro Municipal	4	0	0	0	0
4	Tanzania	Irrigation and Water Resources Management in Mlandizi	5	4	3	1	0
5	Tanzania	Export Trade of Commercial Crafts	7	5	2	2	0
Total			26(17)	11(8)	8(5)	17(17)	2(2)

Remarks 1 The number of each rating shows the following.
5: Yes, very much 4: Yes 3: Medium 2: Not so much 1: Not at all
Remarks 2 The number shown in parentheses indicates the number of women included in the total respondents.

With regards to the participants of the grassroots training, 37 out of 64 respondents selected either (5) or (4) for the same question (Table 10). Although it is difficult to generalise the answers, as the sample size is small, the extent of the establishment of knowledge and technology among the participants is regarded as relatively high. From the viewpoint of each course, more than half of the respondents of four courses, excluding the Rural Women Empowerment training course in Kenya, selected either (5) or (4). Thus, the extent of the establishment of knowledge and technology for four courses reached a certain level.

The achievement of the overall goal of Phase III is relatively high because the establishment of the knowledge and technology disseminated through the CEP is high, while that of the grassroots training is slightly lower.

2) Achievement of Outputs and Project Purpose (after Project Completion until the Ex-Post Evaluation)

After the completion of Phase III, no significant change was observed in terms of AICAD's planning and coordinating capacity, while the network functions as well as the volume of the training and extension activities have been decreasing (Table 11). Thus, there is a problem with the achievement of the outputs, which has resulted in a small contribution to the achievement of the project purpose and overall goal. Some concerned people have pointed out the lack of funds as well as the delay of the bank transfer of the budget from each government to AICAD as the reasons for the decreased number of training and extension activities. However, the total amount of the budget remains to be almost the same as that of Phase III, to be explained later in Section 3.4 ('Sustainability from Financial Aspect'). According to the interviews with those who are concerned with the project, the major reasons for the decreased volume of activities are: decrease in substantial amount of the budget due to the handling charge and foreign exchange loss of the bank transfer of the budget from the three governments to AICAD HQs and from HQs to each CO in the three countries; the transfer of the program budget from HQs to COs made only after securing the staff's salary (sometimes the first bank transfer from HQs to COs for activities was made about two months before the end of the fiscal year); and the frequent delay in sending funds from the three governments to AICAD HQs. Although AICAD maintains a network with the trainers who have expertise in and are eager to support training and extension organized by COs, it has not been effectively used due to a lack of funds and a delay in the governments' budgets. On the other hand, the formulation and implementation of strategy by HQs to acquire support from new donors have not yet progressed, so the shortage of funds has not improved.

Table 11: Transition of Extension Programs

(Unit: number of programs)

Phase	Phase II						Phase III						After Phase III			
Fiscal Year	2002	2003	2004	2005	2006	**Total**	2007	2008	2009	2010	2011	Total	2012	2013	2014	Total
KTDP (New)	**0**	**0**	**0**	**0**	**0**	**1**	**6**					**6**	**0**	**0**	**0**	**0**
Kenya	0	0	0	0	1	1	2					2	0	0	0	0
Uganda	0	0	0	0	0	0	3					3	0	0	0	0
Tanzania	0	0	0	0	0	0	1					1	0	0	0	0
CEP (New)							**6**					**6**	**0**	**0**	**1**	**1**
Kenya							3					3	0	0	1	1
Uganda							2					2	0	0	0	0
Tanzania							1					1	0	0	0	0
UOA (Symposium)							**0**	**0**	**0**	**1**	**4**	**5**	**0**	**0**	**0**	**0**
Kenya							0	0	0	0	1	1	0	0	0	0
Uganda							0	0	0	0	1	1	0	0	0	0
Tanzania							0	0	0	0	1	1	0	0	0	0
Region (Kenya, Tanzania and Uganda)							0	0	0	1	1	2	0	0	0	0
UOA (Pilot)							**0**	**0**	**0**	**0**	**4**	**4**	**0**	**0**	**0**	**0**
Kenya							0	0	0	0	2	2	0	0	0	0
Uganda							0	0	0	0	1	1	0	0	0	0
Tanzania							0	0	0	0	1	1	0	0	0	0

Source: AICAD

Remarks 1: The above figures show the new activities in each phase.

Remarks 2: The fiscal year in the above three countries is from July until June.

Table 12: Transition of Training Programs

(Unit: number of programs)

Phase	Phase II						Phase III						After Phase III			
Fiscal Year	FY2002	FY2003	FY2004	FY2005	FY2006	**Total**	FY2007	FY2008	FY2009	FY2010	FY2011	Total	FY2012	FY2013	FY2014	Total
Regional Training	**1**	**2**	**2**	**1**	**2**	**8**	**2**	**0**	**0**	**2**	**2**	**6**	**1**	**1**	**1**	**3**
In-country training	**2**	**4**	**4**	**9**	**3**	**22**	**7**	**6**	**6**	**6**	**6**	**31**	**2**	**3**	**2**	**7**
Kenya	0	2	1	3	2	**8**	3	2	3	3	2	**13**	1	1	1	**3**
Uganda	1	1	2	3	0	**7**	2	2	1	1	2	**8**	0	1	0	**1**
Tanzania	1	1	1	3	1	**7**	2	2	2	2	2	**10**	1	1	1	**3**
Grassroots training	**0**	**0**	**2**	**6**	**4**	**12**	**2**	**3**	**3**	**3**	**3**	**13**	**4**	**0**	**0**	**4**
Kenya	0	0	1	2	1	4	0	1	2	0	0	3	0	0	0	0
Uganda	0	0	1	2	3	6	1	2	1	1	0	5	4	0	0	4
Tanzania	0	0	0	2	0	2	1	0	0	2	2	5	0	0	0	0

Source: AICAD

Table 13: Transition of Research Project

(Unit: number of programs)

Phase	Phase II						Phase III						After Phase III			
Fiscal Year	FY2002	FY2003	FY2004	FY2005	FY2006	**Total**	FY2007	FY2008	FY2009	FY2010	FY2011	Total	FY2012	FY2013	FY2014	Total
Research (except for NERICA dissemination)	**11**	**23**	**40**	**28**	**17**	**119**	**N/A**	**N/A**	**N/A**						**3**	**3**
NERICA Dissemination (including some research)							○	○	○							

Source: AICAD

Remarks: AICAD HQs managed the three research projects in fiscal year (FY) 2014, which supported the Jomo Kenyatta University of Agriculture and Technology, the Sokoine University of Agriculture and Busitema University for three years, with a maximum budget of USD60, 000 in the three countries.

(2) Other Impacts

1) Impacts on the Natural Environment

In a CEP in Kenya, a cattle dip was constructed near a water source, which resulted in the residents' expressing concerns.

2) Land Acquisition and Resettlement

In the same CEP in Kenya above, the construction site of the cattle dip was found to be a land with disputes over property rights (although the community explained that there was no problem in terms of property rights in the planning stage).

3) Other Indirect Impacts

In response to the question 'Have the knowledge/skills acquired through the CEP activities contributed to increase your income?' in the beneficiary survey mentioned above, 80 out of the total number of the respondents, i.e., 134, of the six CEPs selected either 'Yes, very much' (5) or 'Yes' (4) (Table 14). Thus, CEP was effective to some extent. On the other hand, regarding the response to the same question about the effect of grassroots training on increasing income, 24 (38%) out of 64 respondents of the same five training chose either (5) or (4), which is lower than for CEP (Table 15). CEP, which combines multiple schemes and supports specific target area intensively, is regarded as being more effective than capacity building by means of training only.

Table 14: Have the Knowledge/Skills Acquired through the CEP Activities Contributed to Increasing Your Income?

(Unit: person)

	Country	Project Name	5	4	3	2	1
1	Kenya	Integrated Irrigation Farming Project	4	9	6	4	4
2	Kenya	Water Harvesting and Management Project	4	8	7	5	8
3	Kenya	Livestock Production Project	4	9	7	5	4
4	Uganda	Improving Livelihoods in Kakindu Sub-country through Building Capacity for Soil and Water Conservation and Agroforestry	14	5	0	1	0
5	Uganda	Promotion of Income Generation among Persons with Disability in Butayunja Sub-county	11	7	1	0	0
6	Tanzania	Empowering Women for Poverty Reduction (Food Processing)	2	3	2	0	0
Total			39(17)	41(20)	23(14)	15(11)	16(11)

Remarks 1 The number of each rating shows the following.
5: Yes, very much 4: Yes 3: Medium 2: Not so much 1: Not at all
Remarks 2 The numbers shown in parentheses indicate the number of women included in the total respondents.

Table 15: Have the Knowledge/Skills Acquired through the Grassroots Training Contributed to Increasing Your Income?

(Unit: person)

No	Country	Name of Training/Workshop	5	4	3	2	1
1	Kenya	Rural Women Empowerment	0	2	16	0	0
2	Uganda	Rural Women Empowerment	8	3	1	0	1
3	Tanzania	Food Processing Training Course for Morogoro Municipal	0	0	3	1	0
4	Tanzania	Irrigation and Water Resources Management in Mlandizi	1	5	4	3	0
5	Tanzania	Export Trade of Commercial Crafts	2	3	7	4	0
Total			11(8)	13(9)	31(25)	8(6)	1(1)

Remarks 1 The number of each rating shows the following.
5: Yes, very much 4: Yes 3: Medium 2: Not so much 1: Not at all
Remarks 2 The numbers shown in parentheses indicate the number of women included in the total respondents.

In response to the question 'Have the knowledge/skill acquired through the activities contributed to empowerment of women?' to the participants of CEP 'Improving livelihoods in Kakindu Sub-county through building capacity for soil and water conservation and agroforestry' in Uganda, 19 out of 20 respondents replied with either (5) or (4). For this reason, many respondents pointed out that women came to have their own incomes. However, in other programs or in the rest of the countries, the same tendency has not yet been observed.

Meanwhile, in a CEP in Kenya, conflict occurred among the villagers over the property right of a water tank that the project provided for the purpose of demonstration. As a result, the human relationships of the villagers deteriorated[20]. Currently, the conflict has subsided since AICAD provided water tanks to the villagers (on an individual basis) in the same village.

For the reasons stated above, the impact of Phase III is fair.

As stated above, the achievement of the overall goal for both phases is medium. It was observed that the knowledge and technology disseminated through the CEP in Phase III have been established to some extent, although it did not much contribute to the overall goal. The project had to go through trial and error throughout both phases to establish an approach of technology dissemination. However, the establishment of knowledge and technology to some extent was brought by the CEP, which focuses on a specific target area and combines some schemes, such as training, technical guidance, small equipment provision and field visits, with using the participatory planning method.

Therefore, impact of the project throughout both phases is fair.

[20] Interviews at and questionnaire for Kenya CO and AICAD, as well as beneficiary survey with CEP participants

Since this project has to some extent achieved the project purpose and overall goal, effectiveness and impact of the project are fair.

3.3 Efficiency (Rating: ②)

3.3.1 Inputs

The inputs of each phase are shown in Table 16 and Table 17.

Table 16: Inputs in Phase II

Inputs	Plan	Actual
(1) Experts	8 experts (Long term: 5 experts; short term: approximately in 3 sectors as needed)	51 experts in total (Long term: 17 experts; short term: 34 experts)
(2) Trainee received	Training in Japan: as needed Third-country Training：as needed	15 trainees received in Japan 3 trainees in third-country training (Indonesia, Thailand)
(3) Equipment	Training equipment, etc., as needed	Computers; software; equipment related to computers; office equipment, such as photocopier; equipment related to GIS; facility for research and development, etc.
(4) Others	None	None
Japanese Side Total Project Cost	N.A	1,559 million yen
Kenya, Tanzania and Uganda Operational Expenses	N.A	5,186,821 U.S. dollars

Table 17: Inputs in Phase III

Inputs	Plan	Actual
(1) Experts	Approximately 8-11 experts (Long term: 5-8 experts; short term: 3 experts)	12 experts in total (Long term: 8; Short term: 4)
(2) Trainee received	Training in Japan targeting AICAD staff (or third-country training or in-country training). (No clarification of the numbers)	10 trainees received in Japan 3 trainees in third-country training
(3) Equipment	Vehicles, etc. (No description on the amount)	5 vehicles, photocopiers and other office equipment
(4) Others	Local cost support：Training cost, demonstration, dissemination, development and activity support cost, NERICA research for demonstration and registration support activity, cost for information maintenance and dissemination activity, etc. (No clarification of the amount)	Local cost support 164 million yen
Japanese Side Total Project Cost	1,360 million yen (to be reviewed at the time of mid-term evaluation)	447 million yen
Kenya, Tanzania and Uganda Operational Expenses	Fund from the three countries: 110 million yen/year AICAD (revenue from facility rent): 0.2 million yen	Approximately 650 million yen[21] (4,725,983 US dollars)

[21] USD1 =Yen117.28, based on the exchange rate of August 24, 2007 (137 million yen per year on average)

3.3.1.1 Elements of Inputs

【Phase II】

As for the Japanese inputs, the number of Japanese experts drastically increased from the planned figure, i.e. 8 persons, to the actual figure, 51 persons. As for the inputs from the African side, the contribution from the three governments totalled 5,186,821 U.S. dollars. The number of counterparts allocated was 30, which is much less than the planned figure, i.e. 52[22]. However, the base for calculation of 52 is not clear because it was not shown in the implementation study report. Meanwhile, no specific influence caused by the decrease in the number of counterparts was observed. Hence, there is a possibility that the planned figure itself was not appropriate.

【Phase III】

As for the Japanese side, there was no significant gap between the planned and the actual inputs (although there was a wide gap between the planned and the actual project cost, which will be explained later). The inputs from the African side were almost as planned.

3.3.1.2 Project Cost

【Phase II】

It is not possible to compare the actual cost, 1,559 million yen, with the planned because there is no description of the planned figures at the time of the ex-ante evaluation.

The settlement of expenses for some research projects was delayed due to confusion caused by different views on financial settlement between both sides and the shortage of a mutual understanding[23].

【Phase III】

The contribution from the three countries totalled 4,725,983 U.S. dollars in five years, which was almost as planned. The project cost borne by the Japanese side was 447 million yen, which shows a drastic decrease by 33% compared with the planned figure, i.e. 1,360 million yen. This is because the outline of support for Phase III was not fixed after the completion of Phase II until the commencement of Phase III. Thus, Phase III started with setting a temporary figure for the planned amount of the project cost, using the actual cost of Phase II as reference, on the condition that the figure should be reviewed at the mid-term review. In fact, the actual project cost of Phase III drastically decreased from the planned figure, as the activities supported in Phase III were much more focused on extension and training compared with in Phase II. Although there was no problem in the amount of the contribution from the African side, a frequent delay of remittance from the three governments to AICAD HQs, and AICAD HQs to

[22] Ex-ante evaluation summary attached to the implementation study report
[23] Interviews with those concerned with the project

its COs prevented AICAD from implementing activities in accordance with the plan.

3.3.1.3 Project Period

【Phase II】The project period of Phase II was five years as planned (100%).

【Phase III】The project period of Phase III was four years and ten months, which was shorter than the planned five years (97%).

As stated in relation to the project's effectiveness, the overall achievement of eight outputs of Phase II is medium. Although the number of Japanese experts increased compared to the plan, it cannot be compared to the plan, as the planned number of total inputs is not shown. No problem was seen for the inputs from the African side. The project period of Phase II was as planned (100%). Thus, the efficiency of Phase II is fair.

The overall achievement of three outputs of Phase III is relatively high. The project cost and the project period are within the plan (33% and 97%, respectively). The project cost drastically decreased compared to the plan, as Phase III started with a temporary planned figure, and the scope of work was focused during the implementation period. Thus, the efficiency of Phase III is high.

Therefore, the project's efficiency throughout both phases is fair.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

After the completion of Phase III until the time of the ex-post evaluation, the policy direction toward poverty alleviation of the three governments was maintained as shown in 'The Vision 2030' (2007-2030) in Kenya, 'The Tanzanian Development Vision 2025' (2000-2025) and 'The National Development Plan' (2010–2014). Thus, the project direction is highly consistent with the policies of the three countries. It is hardly possible that this policy direction will be drastically changed in the future as well. Therefore, the policy and institutional aspects of sustainability are high.

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

AICAD's internal mechanism for regular activities was established at the three divisions, i.e. research, training and extension and information dissemination. The number of staff at HQs and COs was maintaining almost the same level at the time of the ex-post evaluation (16 for HQs, 12 for COs and 28 in total), compared with at the completion of Phase II (18 for HQs, 12 for COs and 30 in total) and of Phase III (16 for HQs, 12 for COs and 28 in total). On the other

hand, the number of staff who know the situation during the project implementation period is already limited due to the high turnover of the staff at COs. In the meantime, a monitoring structure at the project sites has not been established because of the lack of funds after the project completion. After the project completion, COs could not conduct monitoring with the communities sufficiently due to a lack of funds and a low priority of the budget allocation. Consequently, it resulted in the delay of coordination with the communities by a certain CO, which led to the deterioration of human relationships arising from mistrust among the members, and to the stagnation of activities. Also, the Uganda CO was still in the process of acquiring the legal status as a region-based international organisation at the time of the ex-post evaluation, although HQs, the Kenya CO and the Tanzania CO had already acquired this.

The collaborative relationship between the member universities and AICAD has been weakened except for in some cases. Also, almost no reporting and information sharing have been done between each CO and the ministry in charge of education in the respective country, as connections between them have not been established. COs have been unable to monitor or support the implementation of those activities since information about the activities that HQs have conducted has not been relayed to COs.

On the other hand, some teaching staff who had participated as trainers of training or resource persons of extension programs in the past gave some comments such as: 'I have learned that community people are familiar with reality of the sites, and they have more knowledge than the university students' and 'Teaching community people requires trainers to devise ways of explaining such as using simple expression, etc., but many of them are highly motivated participants'. Many of the teaching staff replied that they were willing to participate again, if given another opportunity. However, for university teaching staff, spending time on training and extension will not be reflected in promotion, although publishing a research paper will be reflected. Hence, this has become a bottleneck for their participation in training and extension. Thus, sustainability from organisational aspects is determined to be relatively low.

3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

The capacity of teaching staff at the member universities to develop training and extension packages based on the research results is determined to be sufficient, considering the achievement of the training and the KTDP. Also, teaching staff who are eager and remarkable have remained a part of the activities as trainers of training courses and resource persons of extension programs. However, the capacity of these staff has been underutilized due to the decreased scale of activities.

Meanwhile, there is no specific problem in the level of AICAD's capacity to formulate an annual plan as well as to coordinate things for training implementation. On the other hand, the capacity of AICAD to plan new programs, to use leadership for strengthening collaboration

with the organisations concerned and to acquire new research funds is not regarded as sufficient.

As stated above, there is no problem in terms of the capacity of university teaching staff concerned with training and extension, as well as AICAD's capacity to plan activities and to complete the necessary coordination for implementing training. On the other hand, AICAD's capacity to plan new programs and to acquire new research funds is insufficient, and monitoring at the project site is not sufficiently conducted. Hence, sustainability from the technical aspects of the implementing agency is determined to be fair.

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effects

The transition of the total budget amount after the completion of Phase III is shown below. Since the project completion in FY 2011, the three governments have been covering almost the same amount as the cost, which used to be covered by the Japanese side for the program activities (Table 18). It is remarkable that the amounts of the contributions from the three governments have remained almost the same amounts made after the completion of Phase III in FY2011 (except for FY 2014, which showed a 14% decrease compared with the previous year). Especially, Kenya has been covering more than half of the total contribution every year.

Table 18: Transition of Total Project Budget

(Unit: Thousand USD)

	Phase III					After project completion		
Fiscal Year	2007	2008	2009	2010	2011	2012	2013	2014
Japanese side	221	340	356	417	411			
Kenya, Tanzania, Uganda side	978	1,100	876	875	896	1,306	1,264	1,112
Total	1,199	1,440	1,232	1,292	1,307	1,306	1,264	1,112

Source: JICA terminal evaluation report and interview with AICAD

Remarks 1: The amount of the total project budget above is the one based on the Japanese fiscal year, different from that of the local fiscal year.

Remarks 2: The amount for the Japanese side was calculated with the exchange rate (TTS) from the Japanese Yen to U.S. dollars on September 1 each fiscal year (except for 2007, when the data were unavailable and were calculated with the rate on September 3).

Table 19: Revenue and Expenditure of AICAD

(Unit: Thousand USD)

Fiscal Year	2009	2010	2011	2012	2013	2014
Revenue	1,435	1,438	1,542	1,730	1,855	1,782
Expenditure	1,565	1,591	1,651	1,504	1,617	1,995
Balance	-131	-163	-109	227	238	-213

Source: Based on terminal evaluation report, questionnaire and interview survey with AICAD

Remarks: The balance can be different from the simple subtraction because the figures are rounded off.

At the time of the terminal evaluation of Phase III, the evaluation report indicated some concern with the deficit of AICAD. Although it went into the black in FY2012 and 2013 after the project completion, it went into the red again in FY2014 (Table 19) due to the decrease of the contribution, and its future tendency is unpredictable.

With regards to other concerns, the revenue from rental fees from the training and accommodation facility has decreased every year since FY2011, which is the last year of Phase III, while it has been fluctuating every year. Also, PAU, which was using the training facility on a regular basis at the time of the ex-post evaluation, has been constructing its own school building. Hence, its rental fee will not arise starting in 2016, which means a decrease in revenue. In addition, 115,148,716 Kenyan shillings (approximately 150,180 U.S. dollars) of the membership fees of the universities are unpaid. Concerning the funds from other donors, in addition to the training that has been jointly conducted, a training program has been conducted for local governments in collaboration with United Nations Human Settlements Programme (UN-HABITAT) since 2014. However, information on the budget amount was not available. AICAD has not acquired research funds yet.

Table 20: Revenue from AICAD Facilities

(Unit: Thousand USD)

FY 2011	FY 2012	FY 2013	FY 2014
190	101	166	147

Source: Based on questionnaire and interview survey with AICAD

Paying attention to the expenditure, administration cost shares about 85% of it, and activity about 15%, while the ratio of the administration cost within the total expenditure has been high since Phase III up to the ex-post evaluation (Table 21). Some people concerned with the project pointed out that the lack of funds was the cause of the decreased scale of activities after the project completion. Actually, however, the program activity cost has not been decreasing. Also, other comments were heard concerning major causes of the decrease in activities, such as the frequent delay of the contributions from the three countries, as well as the decrease of the actual value of the budget caused by a remittance charge and foreign exchange loss and securing salaries before sending money for activities to COs (so the first remittance in a fiscal year from HQs to COs for activities sometimes can be received two months before the end of the fiscal year). In addition, the fact that almost the same number of staff has been maintained since Phase II is also regarded as weakening sustainability from a financial aspect. In this phase, JICA provided a large scale of support (1.6 billion yen for the project cost borne by Japanese side) as a technical cooperation project, when a certain number of staff were recruited with a region-based international organisation staff status, while the amount of JICA support (450

million yen) as well as the volume of the activities decreased in Phase III.

Also, according to AICAD's mid-term framework budget draft (Table 22), although the total budget amount has a tendency to increase, the budget for the activity will decrease by 34% compared with the previous year in 2016, and the employment costs will be increased by 196%. The decrease of activities in volume can also lead to a decrease in a unifying force with the member universities, which has a risk of increasing unpaid membership fees.

Therefore, sustainability from a financial aspect is relatively low.

Table21: AICAD's Total Expenditure and the Breakdown

(Unit: Thousand USD)

Fiscal Year	2011	2012	2013	2014
Program cost	207	252	241	368
(Percentage)	(13%)	(17%)	(15%)	(18%)
Administrative cost	1,444	1,252	1,376	1,627
(Percentage)	(87%)	(83%)	(85%)	(82%)
Total expenditure	1,651	1,504	1,617	1,995

Source: Based on questionnaire and interview survey with AICAD

Table22: AICAD Mid-term Framework Budget Draft

(Unit: Thousand Kenyan shilling)

Fiscal Year	2014	2015	2016	2017
Total budget	151,507	170,053	180,575	189,603
Program budget	58,000	71,921	24,100	25,305
Employment cost	48,282	46,375	91,075	95,628

Source: AICAD GB meeting document

Remarks: 1 Kenyan shilling was 1.126 Yen (JICA monthly exchange rate, December 2015, JICA web page)

Throughout both phases, all of the three countries have firmly maintained the policy to place emphasis on poverty alleviation consistently from the planning stage. Hence, sustainability from the policy and institutional aspects is high. Furthermore, the internal mechanism of AICAD's regular activities in the three divisions of research, training and extension and information has been maintained, and almost the same number of staff was maintained at the time of the ex-post evaluation both at HQs and COs as during the project implementation period. On the other hand, the turnover of staff at COs is high. Also, the collaborative relationship between the member universities and AICAD, which AICAD had been claiming to have from the beginning, has been generally weakened. Hence, sustainability from an organisational aspect is relatively low.

The capacity of the teaching staff who develops training and extension packages or plays the

role of resource person for extension programmes and the trainer of training courses is regarded as sufficient. Although no problem has been observed in terms of AICAD's capacity of planning conventional programs and of coordinating things necessary for conducting training, the capacity to plan new programs and to acquire new research funds cannot be determined to be sufficient. In addition, insufficient monitoring at the project site caused by a lack of funds as well as the low priority of on-site monitoring and follow-up in the budget allocation led to a negative impact in Kenya. Thus, sustainability from a technical aspect is fair. In terms of sustainability from a financial aspect, the contribution from the three governments has been disbursed almost as committed, and a budget amount that is almost equivalent to the budget for during the implementation of Phase III has been secured. On the other hand, the ratio of administrative cost has been high and that of the program cost low, as the share of the administrative cost among the total expenditure has been about 85% since Phase III until the time of the ex-post evaluation, while activity cost has been about 15%. Also, the activity cost is expected to decrease, while the employment cost is expected to increase in FY2016, although the total budget is expected to be increased. A decrease in the volume of activities can not only lead to a decrease in unifying power towards the member universities but also aggravate the status of unpaid membership charges. A decrease in the volume of the activities has resulted in a lower presence of AICAD toward the member universities. Thus, sustainability from a financial aspect is relatively low.

Based on the above, some minor problems have been observed in terms of the organisational, technical and financial aspects of the implementing agency. Therefore, the sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to establish AICAD in order to conduct training and extension packages based on research that contributes to poverty alleviation and human resources development in collaboration with the member universities and to enhance self-support of AICAD in Kenya, Tanzania and Uganda. Poverty alleviation was consistent with the policy and development needs of the three target countries (i.e. Kenya, Uganda and Tanzania) and Japan's ODA policy. Therefore, relevance of the project is high. In Phase II of the project, although networks with the teaching staff and other important players at the member universities were established, the development and implementation of training and extension packages based on the research results were insufficient. In Phase III, although outputs and project-purpose achievements were enhanced by focussing on extension packages as the target of JICA's support, the relationship with the university teaching staff was weakened. Additionally, the extent of knowledge

establishment and skills acquired by the participants through the project's training and extension packages is regarded to be fair for Phase II and relatively high for Phase III. Therefore, effectiveness and impact of the project are fair. Regarding the project costs borne by the Japanese side in Phase II, it is necessary to consider that the input of human resources significantly increased compared to the planning stage, although specific figures related to the planned budget were not mentioned, while effectiveness and impact are fair. In Phase III, the project cost from the Japanese side drastically decreased compared to the planning stage because the planned figure was temporarily set and the substantial area of support from JICA was narrowed down drastically after project commencement. On the other hand, the cooperation period for Phases II and III was shorter than planned. Hence, efficiency of the project is fair. As for sustainability, some minor problems have been observed in terms of the organisational, technical and financial aspects, although no major problems have been observed in the policy background. Thus, sustainability of the project is fair.

In light of the above, this project is evaluated to be partially satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

- Investigating the causes of the decrease in activities and improving the balance between the activity cost and the administrative cost

AICAD HQs should investigate the cause of the decrease in the volume of the activities in spite of the maintained amount of the activity cost, and improve the balance between the activity cost and the administrative cost. AICAD should make a countermeasure plan under the guidance of GB to make it possible to conduct the activities in an appropriate volume and promptly implement them.

- Securing research fund by acquiring external research fund

AICAD HQs should apply for research funds from international organisations or bilateral donor organisations and so on in collaboration with the member universities, and promptly acquire medium- to large-scale funds for research, which will be practical and contribute to poverty alleviation in the communities.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

- Points of attention in practical research support

When a project plan is formulated to support universities in which practical research is

supported and its result is used within the project period, the following points should be kept in mind:

1) to set a sufficient research period to secure a research result high enough, to be prepared for unforeseeable circumstances

2) to secure a certain amount of funds per research, as there is a possibility that a research study will not conclude if the amount is too small to cover the reflection of the experimental study result

3) to ensure mutual understanding between the project and the researchers prior to the commencement of the research on the required research result, content and the timeframe of the research paper, specific procedure and schedule for the settlement of expenditures

4) to conduct monitoring during the implementation period in a timely manner to avoid deviation or deadlock.

- Duration of an organizational development project which starts with establishing a new organization across multiple-countries and/or to support regional international organization

Strengthening of organisation starting from the establishment of a new organisation requires much more labour and time compared to strengthening an existing organisation. Especially, this project had complicated aspects incorporated, such as supporting the implementation agency to become a region-based international organisation, in addition to targeting multiple countries. Hence, the project could not bring a sufficient level of sustainability of the implementation agency through strengthening of organisation in spite of 12 years of a project period, including a two-year preparation period. If lessons should be learned from this case, it is necessary to set a long project period from the beginning for a project that supports the establishment of a new organisation, targets multiple countries and supports a region-based international organisation in order to produce a certain level of effect.

- Setting specific and logical objectives and indicators and a description of calculation base

In this project, both in Phase II and Phase III, there were some problems in the logicality of setting objectives and the appropriateness of indicators, which required the evaluator to reorganise them. Specifically, some problems were observed, such as: ‘Overall goal is continuation of activities only and not an objective.’ Also, ‘Indicator cannot be used because what it means is unclear.’ Also, a part of the planned amount of inputs, such as the number of counterpart staff to be allocated, was possibly excessive. However, it was difficult to judge whether the planned figure was appropriate or not because its calculation base was not described in the report at the time of planning. It is essential to set clear and logical objectives and indicators according to the basic rule of PDM, and to describe the calculation base in the detailed planning survey report, etc., to conduct an evaluation appropriately and efficiently.

Republic of Uganda

FY2015 Ex-Post Evaluation of Japanese Grant Aid Project
"The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Central Region in Uganda"

External Evaluator: Mayumi Hamada
Foundation for Advanced Studies on International Development

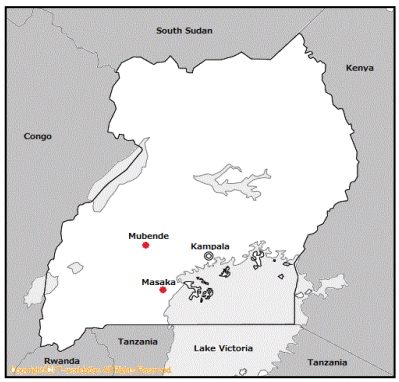
0. Summary

The objective of this project is to enhance the medical services offered by Masaka Regional Referral Hospital (hereinafter Masaka R.R.H.) and Mubende Regional Referral Hospital (hereinafter Mubende R.R.H.), the secondary referral hospitals, by improving the facilities and medical equipment of the both R.R.H.s in the Central Region in Uganda, thereby contributing to the improvement of the local medical referral system.

Uganda has been seeking better access to high-quality medical service by hospitals, with special emphasis on enhancing regional referral hospitals. However, Uganda's major health indices are still at the most seriously low level worldwide, like other African nations. Thus, the project is highly consistent with Uganda's development policy and development needs. Also, the project is highly consistent with the aid policy of Japanese government and JICA, since "health and infrastructure" is included in "improvement of basic well-being", one of the priority areas of the Japan's Official Development Assistance (ODA) policy for Uganda. Therefore, the relevance of the project is high. The outputs were produced in accordance with the plan, and the project's cost was within the plan. However, the project's duration exceeded the plan. Therefore, its efficiency is fair. By improving facilities and equipment, the number of operations and outpatients at both hospitals increased, while the number of deliveries and inpatients as well as the bed occupancy rate also increased at the Maternity Department of Mubende R.R.H., which was supported by the project. Moreover, satisfaction of patients and medical staff also increased due to the improved facilities and equipment. Additionally, the number of patients referred from the lower level hospitals increased at both hospitals. Therefore, the effectiveness and impact of the project are high. On the other hand, the sustainability of the project is fair, since some minor problems in terms of technical aspects and some medium-level problems in the current status of operation and maintenance are observed, although no problems are seen in terms of the institutional and financial aspects of operation and management.

In light of the above, this project is evaluated to be satisfactory.

1. Project Description



Project Locations

Outpatients Department Building of Mubende R.R.H.

1.1 Background

Uganda is a republic in Eastern Africa. Uganda became independent from Great Britain in 1962 and adopted republicanism in 1963. It covers 241,000 square kilometres, which is about 2/3 the area of Japan, and had a population of about 32.7 million (2008). The country's per capita gross national income (GNI) was USD370 (2007)[1].

The levels of major health indices in Uganda, similar to those of neighbouring countries in eastern Africa, are among the worst in the world. Infectious diseases such as malaria, tuberculosis, measles, and HIV/AIDS, etc. also prevail in Uganda, and the country also has had cases of Ebola haemorrhagic fever. To improve these circumstances, the Ugandan government adopted measures such as promoting free medical services, enhancing access by increasing medical facilities, and enhancing service delivery by targeting the community level up to the provincial level. Thanks to these measures, outcomes were obtained to a certain extent, such as the access rate to medical facilities within 5km improving from 49% of the total population (1999) to 72% (2004). Conversely, however, in regional referral hospitals and district hospitals those that act as secondary medical facilities, the facilities have become obsolete and the medical equipment and materials are insufficient. In addition, the population growth rate is also high at 3.2% per year; hence, the demand for medical services is expected to increase further in the future.

Under these circumstances, the Ugandan government requested that the Japanese government implement a grant aid project to improve medical facilities and equipment of core hospitals in the Central Region in 2006.

[1] Preparatory Survey Report

1.2 Project Outline

The objective of this project is to enhance the medical services offered by Masaka R.R.H. and Mubende R.R.H., the secondary referral hospitals, by improving the facilities and medical equipment of the both R.R.H.s in the Central Region in Uganda, thereby contributing to the improvement of the local medical referral system.

<Grant Aid Project>

E/N Grant Limit or G/A Grant Amount/ Actual Grant Amount	Detailed Design: 135 million yen/134 million yen Project: 1,741 million yen/1,648 million yen Total: 1,876 million yen/1,783 million yen
Exchange of Notes Date (Grant Agreement Date)	Detailed Design: November 2009 (November 2009) Project: June 2010 (June 2010)
Implementing Agency	Health Infrastructure Division, Clinical Services, Ministry of Health
Project Completion Date	October 2012
Main Contractors	Construction: The Zenitaka Corporation Procurement of Equipment: Nissei Trading Co., Ltd.
Main Consultants	Consortium of Nihon Sekkei, Inc. and Earl Consultants, Inc.
Basic Design	【Preliminary Survey】 November 2008 【Preparatory Survey】 October 2009
Detailed Design	September, 2010
Related Projects	• Technical Cooperation Project “Project on Improvement of Health Service through Health Infrastructure Management” (2011-2014) • Grant Aid Project “The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Western Region in Uganda” (2013) • Grant Aid Project “The Project for the Rehabilitation of Hospitals and Supply of Medical Equipment in the Eastern Region in Uganda” (1/2: 2005, 2/2: 2006) • Japan Overseas Cooperation Volunteers (Masaka R.R.H. “Medical Equipment” (2011, 2012-2014, 2014-), Mubende

	R.R.H. “Nurse (5S)” (2012-2014), “Medical Equipment” (2014-) • The African Development Bank (AfDB): “Support to Health Sector Strategic Plan Project II” (2008-2013) • The World Bank (WB): “Uganda Health System Strengthening Project” (2010-2017) • The U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) (2004-2017)

2. Outline of the Evaluation Study

2.1 External Evaluator

Mayumi Hamada, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: August 2015 - October 2016

Duration of the Field Study: October 25, 2015 - December 10, 2015

January 31, 2016 - February 13, 2016

3. Results of the Evaluation (Overall Rating: B[2])

3.1 Relevance (Rating: ③[3])

3.1.1 Relevance to the Development Plan of Uganda

The government of Uganda formulated “The Poverty Eradication Action Plan (PEAP)” in 1997, a comprehensive national development plan, and has been updating it since then. The PEAP III, which was valid during the ex-ante evaluation in 2009, stipulated that the government would seek to improve major health indices such as the child mortality rate and maternal mortality rate, etc. in the priority area of “Human Development”.

In order to address the tasks shown in the PEAP, the Ministry of Health formulated the National Health Policy. The Second National Health Policy (2010 - 2020), which was enacted in 2010 and currently valid, indicates that the referral system from the primary to tertiary levels as well as regional referral hospitals at regional level would be strengthened. Additionally, “The Health Sector Strategic Plan (HSSP I)” (2001 - 2005), HSSP II (2006 - 2010), and “The Health Sector Strategic Investment Plan (HSSIP)” (2010 - 2014) were formulated under the National Health Strategy. In HSSP II, the overall development goal was “the attainment of a good standard of health by all people in Uganda, in order to promote a healthy and productive life”, by improving specific objectives, such as improving the utilisation rate of facilities for

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[3] ③ High, ② Fair, ① Low

outpatients at hospitals as well as enhancing the ratio of births at health facilities. HSSIP, which took over the overall goal of the HSSP II, made health infrastructure, including R.R.H.s, one of the five investment focus areas.

Thus, the project, which aims to improve R.R.H.s, has been highly consistent with Uganda's national development plan and health sector policy since the time of ex-ante evaluation until that of ex-post evaluation.

3.1.2 Relevance to the Development Needs of Uganda

During the ex-ante evaluation, the maternal mortality rate was 550 against 100,000 births (2005) and the infant mortality rate was 79 against 1,000 births (2005) [4] in Uganda's health sector, which shows that Uganda's health status was at the worst level in the world, just like its surrounding countries in East Africa. During the ex-post evaluation, the maternal mortality rate was 343 against 100,000 births (2015, World Bank), while the infant mortality rate was 37.7 against 1,000 births (2015, World Bank). Although Uganda's maternity mortality rate and infant mortality rate have shown a certain tendency towards improvement, it is still serious, considering that Japan's maternal mortality is 5 against 100,000 births, while its infant mortality rate is 2.0 against 1,000 births. Hence, the development needs for improving Uganda's health sector were still high at the time of the ex-post evaluation. Additionally, the Central Region of Uganda, the target area of the project, has high population density and a great need for medical services. However, obsolete facilities and equipment have prevented Masaka R.R.H. and Mubende R.R.H. from providing adequate medical services, as it had been 30 to 40 years since their construction.

Thus, the project has been highly consistent with Uganda's development needs and those of the Central Region from the time of the ex-ante evaluation until that of the ex-post evaluation.

3.1.3 Relevance to Japan's ODA Policy

Based on the discussions with the government of Uganda at the Economic Cooperation Policy Dialogue in 1997 and the Project Confirmation Study in 1999, four areas were set as priority areas of Japan's ODA in Uganda. One of the priority areas was "improvement of basic well-being", which includes health infrastructure (ODA Country Data Book 2009). The project aims to enhance the medical services of two R.R.H.s in the Central Region of Uganda by improving facilities and equipment. Therefore, the project's consistency with Japan's ODA policy towards Uganda at the time of the ex-ante evaluation is high, because enhancement of health infrastructure was included in one of the priority areas.

[4] Ex-ante evaluation

As stated above, this project has been highly relevant to the country's development plan and development needs, as well as to Japan's ODA policy. Therefore its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project intended to enhance the efficiency of medical activities at Masaka R.R.H. by reconstructing the facilities to integrate the functions of Outpatient Department, Casualty Department, Operation Theatre, and Laboratory, etc., which had been scattered in the premises. At Mubende R.R.H., which was upgraded from district hospital, the project aims to provide additional functions that are indispensable for an R.R.H., in its Outpatient Department, Casualty Department, Operation Theatre, Laboratory, Maternity Department, and Male Ward, etc. The facilities and equipment provided by the project are shown below.

3.2.1.1 Facilities

As shown below, the facilities were constructed as planned[5] (Tables 1 and 2). The construction of both R.R.H.s was completed in June 2012. Although there were 8 changes from the preparatory survey and 6 changes from the detailed design, those changes were minor and did not influence the project period[6].

Table 1: Planned and Actual Output for the Construction of Facilities (Masaka R.R.H.)

Planned			Actual			Difference
Building	Floor	Contents of the Facilities	Building	Floor	Contents of the Facilities	
OPD/ Casualty Building	GF	Casualty Dept., O.P.D. (Surgical)	OPD/ Casualty Building	GF	Casualty Dept., O.P.D. (Surgical)	None
	1F	O.P.D. (General O.P.D. [Male/Female Consultation, Paediatrics], Specialised Medicine (common))		1F	O.P.D. (General OPD [Male/Female Consultation, Paediatrics], Specialised Medicine (common))	None
OP Theatre/ Laboratory Building	GF	Operation Dept.	OP Theatre/ Laboratory Building	GF	Operation Dept.	None
	1F	Laboratory, Pharmacy, Lecture Room		1F	Laboratory, Pharmacy, Lecture Room	None
Toilet Building	GF 1F	Toilet for outpatients, Toilet for staff, Toilet for persons with disabilities	Toilet Building	GF 1F	Toilet for outpatients, Toilet for staff, Toilet for persons with disabilities	None
Related Facilities		Electric Room, Elevated Water Tank	Related Facilities		Electric Room, Elevated Water Tank	None

Sources: Preparatory Survey Report and JICA internal document

[5] Questionnaire survey to Masaka R.R.H. and Mubende R.R.H.
[6] Interview with main consultants

Table 2: Planned and Actual Output for the Construction of Facilities (Mubende R.R.H.)

Planned			Actual			Difference
Building	Floor	Contents of the Facilities	Building	Floor	Contents of the Facilities	
OPD/ OP Theatre Building	GF	O.P.D. (General OPD [Male/Female Consultation, Paediatrics], Specialised Medicine), Pharmacy, Laboratory	OPD/ OP Theatre Building	GF	O.P.D. (General OPD [Male/Female Consultation, Paediatrics], Specialised Medicine), Pharmacy, Laboratory	None
	1F	Operation Dept. O.P.D. (Special Clinics)		1F	Operation Dept. O.P.D. (Special Clinics)	None
Casualty/ Maternity Building	GF	O.P.D. (Surgical), Casualty Dept.	Casualty/ Maternity Building	GF	O.P.D. (Surgical), Casualty Dept.	None
	1F	Maternity Dept.		1F	Maternity Dept.	None
Toilet Building	GF 1F	Toilet for outpatients, Toilet for staff, Toilet for persons with disabilities	Toilet Building	GF 1F	Toilet for outpatients, Toilet for staff, Toilet for persons with disabilities	None
Male Ward	1F	36 beds, Treatment Room	Male Ward	1F	36 beds, Treatment Room	
Related Facilities		Electric Room, Elevated Water Tank, Septic Tank, Percolation Trench	Related Facilities		Electric Room, Elevated Water Tank, Septic Tank, Percolation Trench	None

Source: Preparatory Survey Report and JICA internal document

3.2.1.2 Equipment

The following equipment was provided to Masaka R.R.H. and Mubende R.R.H. as planned (Tables 3 and 4).

Table 3: Planned and Actual Output for the Equipment (Masaka R.R.H.)

Dept.	Planned	Actual	Difference
	Contents of Equipment	Contents of Equipment	
Operation Dept.	Operating table for orthopaedics, C-arm X-ray unit, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Electrosurgical unit	Operating table for orthopaedics, C-arm X-ray unit, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Electrosurgical unit	None
Casualty Dept.	Suction unit, Operating table, Operating light, Defibrillator, Stretcher	Suction unit, Operating table, Operating light, Defibrillator, Stretcher	None
O.P.D.	Examination couch, Diagnostic equipment set, Centrifuge, Blood transfusion fridge, X-ray viewer	Examination couch, Diagnostic equipment set, Centrifuge, Blood transfusion fridge, X-ray viewer	None

Source: Preparatory Survey Report and JICA internal document

Table 4: Planned and Actual Output for the Equipment (Mubende R.R.H.)

Dept.	Planned	Actual	Difference
	Contents of Equipment	Contents of Equipment	
Operation Dept.	Operating table, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Pulse oximeter	Operating table, Handwashing water steriliser, Anaesthesia machine with ventilator, Autoclave, Operating light, Pulse oximeter	None
Casualty Dept.	Suction unit, Operating table, Operating light, Stretcher	Suction unit, Operating table, Operating light, Stretcher	None
O.P.D.	Examination couch, Diagnostic equipment set, Centrifuge, Drug	Examination couch, Diagnostic equipment set, Centrifuge, Drug	None

	refrigerator, Dental chair/unit	refrigerator, Dental chair/unit	
Maternity Dept.	Obstetric bed, Examination table, Incubator, Resuscitator, Suction unit	Obstetric bed, Examination table, Incubator, Resuscitator, Suction unit	None

Source: Preparatory Survey Report and JICA internal document

3.2.1.3 Soft Component

Technical guidance for enhancing the maintenance and operation (clarification of organisational structure for maintenance and seminars on maintaining and operating equipment) was conducted as planned from June to September 2012. The operational and maintenance capacities of the provided equipment by implementation of the seminars were enhanced as planned. On the other hand, "clarification of organisational structure for maintenance" was partially unachieved, as a re-training plan was examined but not decided upon.

The points that were not attained as planned were clarification of the management structure (I-1) and "confirmation of implementation schedule, trainees, and the contents based on a re-training plan" (I-3). As for the former, those who were concerned with the project at Masaka R.R.H.[7] did not think that the names of the responsible persons were confirmed and shared among the hospital staff. However, there were no substantial problems, because Masaka R.R.H. appointed persons in charge of maintenance after the project completion[8]. As for the latter, a re-training plan was considered but not confirmed.[9]

Table 5: Planned and Actual Output (Soft Component)

Items		Confirmatory Method	Result	Gap
I. To establish a sustainable equipment maintenance system in the targeted hospitals	I-1. To clarify the management system (staffers, chain of command) of medical equipment	・To confirm the organisational chart of the maintenance system ・ To confirm the names of the responsible persons	・An organisation chart for the maintenance structure was formulated. ・ Names of responsible persons were confirmed (except for Masaka R.R.H., where they were not confirmed or understood among those concerned).	Partially achieved
	I-2. To establish a collaboration system between the hospitals and the Central Workshop[10] of the MOH	・ To confirm the formulated organisation and collaboration chart between R.R.H. and the Central Workshop (including the names of the persons in charge) and the chain of its command	・An organisational chart was formulated to show the collaborative system for maintenance between the R.R.H.s and the Central Workshop of the MOH (with description of names of persons in charge)	None
	I-3. To consider the	・ To confirm the re-training plan and knowledge sharing	・It was confirmed that a draft re-training plan was formulated	Partially achieved

[7] Questionnaire and hearing at Masaka R.R.H.
[8] Questionnaire and hearing at Masaka R.R.H.
[9] JICA internal document
[10] A section of the MOH that is in charge of maintaining the public hospitals in the Central Region of Uganda

	implementation of the re-training plan regarding the operation of equipment in clinical aspects	with the MOH ・ To confirm the detailed implementation schedule such as expected dates, trainees, and the contents based on the re-training plan	and shared with the Ministry of Health. ・The detailed implementation schedule such as expected dates, trainees, and the contents were considered but not confirmed.	
II. To strengthen the operation and maintenance abilities of the medical staffers who operate the equipment of the targeted hospitals	II-1.To introduce operational and maintenance methods at the target hospitals	・To prepare (i) the daily maintenance manual which is necessary for medical staff to conduct regularly ・ To prepare (ii) the operation manual for equipment in a clinical field, which is necessary for medical staff to use the equipment properly ・To confirm understanding of operations and maintenance for medical staff based on the above (i) and (ii) by questionnaire or examination papers	・ The daily maintenance manual (i) for medical staff was formulated. ・The operation manual for the equipment (ii) for medical staff to use the equipment appropriately was developed. ・ It was confirmed through examination or questionnaire that the medical staff understood how to utilise the developed manuals ((i) and (ii)).	None

Source: Preparatory Survey Report and JICA internal document

Remarks: The confirmatory method was the means of measuring achievements that were set prior to the project's implementation.

The short-term seminars conducted under the Soft Component were designed to be held repeatedly with the same content so that the medical staff at both R.R.H.s could participate more easily, since they were busy. Repeated participation was encouraged to fix their understanding. Also, the first-class Ugandan medical professionals, such as those working for Mulago National Referral Hospital, teaching at Makerere University, etc., were selected as the trainers, so that the participants could acquire practical and proper equipment operation methods based on actual experience (interview with the main consultants). According to the interviews with the seminar participants, which were conducted as part of the beneficiary survey during the ex-post evaluation, 15 out of 18 participants at Masaka R.R.H. and 11 out of 13 participants at Mubende R.R.H. chose either 5 (very easy to understand) or 4 (easy to understand, to some extent) on a 5-point rating of "To what extent was the seminar easy to understand?" Hence, the seminars above are regarded to have been effective, to a certain extent.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost borne by the Japanese side was 1,783 million yen, which was 95% of the planned figure, i.e., 1,876 million yen, the maximum amount of the Exchange Note (E/N) and the Grant Agreement (G/A). Thus, the cost was lower than planned. This gap resulted from

the difference between the maximum amount of the E/N and G/A and the bidding price of the successful bidder. The cost borne by the Ugandan side was planned to be about 18 million yen[11] for demolishing existing facilities, etc., although the actual amount was not available.

3.2.2.2 Project Period

The project period was from November 30, 2009, to October 10, 2012. It lasted 35.4 months[12], which was longer than planned (133%), as it was planned to last 27 months, including the detailed design and bidding processes. Major causes of the delay included the delayed commencement of construction works due to the presidential election (1.5 months) as well as delays in the arrival of fittings due to flooding in Thailand (4 months). As for the main obligations of the Ugandan side, there were no delays that led to extensions of the project period.

As stated above, although the project cost was within the plan, the project period exceeded the plan. Therefore, efficiency of the project is fair.

3.3 Effectiveness[13] (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicators)

3.3.1.1 Operation Indicators

(1) Masaka R.R.H.

Table 6 shows the achievement of the operation indicators for Masaka R.R.H., i.e., the number of operations, outpatients, and casualties (accident cases).

The number of operations at Masaka R.R.H. increased to 19,237 in 2014, i.e., 2.2 times compared with the baseline number of 8,663 in 2007, and 1.5 times the figure in 2012 (12,601), when the construction of the new buildings was completed and they started functioning. Also, the number of both major and minor operations has been increasing every year since 2012. The number of outpatients was 294,481 in 2014, which increased to 1.5 times the baseline data in 2007, i.e., 198,264, and 1.3 times of 2012 (231,035). The number of outpatients has been increasing every year since 2011. The number of casualties (accident cases) increased 6.3 times from 2,792 in 2007 to 17,704 in 2014, showing a drastic increase. Also, it is 1.2 times the figure in 2012 (14,576).

Based on the above, the number of operations, outpatients, and casualties (accident cases) increased compared with the baseline data, and these indicators are regarded to have been achieved.

[11] Preparatory Survey Report

[12] The contract between the main consultant and JICA was extended until June 30, 2013, due to the delay in the procedures of revising the Authority to Pay (A/P) by the Ministry of Health and the Ministry of Finance.

[13] Sub-rating for effectiveness is to be put with consideration of impact.

Table 6: Achievement of the Operation Indicators (Masaka R.R.H.)

Indicator	Baseline 2007	Target 2015	Actual 2010	Actual 2011	Actual 2012	Actual 2013	Actual[14] 2014
	Baseline Year	3 Years After Completion	2 Years Before Completion	1 Year Before Completion	Completion Year	1 Year After Completion	2 Years After Completion
Number of Operations	8,663	increase	10,672	NA	12,601	16,661	19,237
Major Operation	NA	NA	NA	NA	2,604	3,210	3,716
Minor Operation	NA	NA	NA	NA	9,997	13,451	15,521
Number of Outpatients	198,264	increase	N/A	187,062	231,035	254,944	294,481
Casualty (Accident cases)	2,792	NA	10,897	NA	14,576	14,567	17,704

Sources: Ex-ante Evaluation, Preparatory Survey Report, Annual Health Sector Performance Report, and Hearing/Questionnaire Survey in Masaka R.R.H.

Remarks 1: Although the baseline number of operations was 2,491 in the Ex-ante Evaluation, the total number of major and minor operations obtained through hearings at the hospital is shown in the table above. This is because the original figure includes only major operations, according to the Preparatory Survey Report.

Remarks 2: Although the baseline number of outpatients (2007) was 252,969 in the Ex-ante Evaluation, Masaka R.R.H. pointed out that baseline data likely included the figures of not only Masaka R.R.H. but also other hospitals in Masaka District. Therefore, the data from the Annual Health Sector Performance Report 2007/08 was utilised as the baseline data instead.

Remarks 3: Although the baseline data for the number of casualties (accident cases) in 2007 was quoted from the Preparatory Survey Report, the actual data includes casualties other than accident cases, since the data was not available.

(2) Mubende R.R.H.

Table 7 shows the achievement of the operations indicators for Mubende R.R.H., i.e., the numbers of operations, outpatients, casualties (accident cases), deliveries, and inpatients, as well as the bed occupancy rate.

The number of operations at Mubende R.R.H. increased to 7,465 in 2014, which is 1.2 times of the baseline data in 2007 (6,465) and 1.5 times of 2012 (5,017), when the construction of new buildings was completed and they started functioning. The number of outpatients increased to 103,013 in 2014, which is 1.2 times the baseline data in 2007 (83,620) and 1.2 times that of 2012 (86,715). On the other hand, the data on the number of outpatients for casualties (accident cases) was not available[15]. Also, the numbers of outpatients for the Ophthalmology Department and ENT Department, which were newly established or improved with equipment provisions, have fluctuated by year, and have not necessarily shown clear increases.

On the other hand, the number of deliveries increased to 4,393 in 2014, which is 2.2 times that of 2007 (2,021) and 1.3 times that of 2012 (3,383). Within these figures, the number of normal births increased from 1,045 in 2007 to 3,363 (3.2 times) in 2014, while Caesarean

[14] In the Ex-ante Evaluation, the target figure is shown as the figure in 2015. However, the data in 2014 was utilised in this ex-post evaluation, since it was the latest data available at the time of the survey.

[15] The total number of outpatients for casualties, including non-accident cases, at the time of the ex-post evaluation decreased compared with that of 2007. Although the key staff at the R.R.H. was asked for reasons, no information was available.

sections increased from 963 in 2007 to 1,030 (1.1 times) in 2014. Thus, both types of deliveries increased.

The number of inpatients increased from 8,064 in 2007 to 15,526 in 2014, or by 1.9 times, while it is 1.04 times the figure in 2012 (14,896), when the construction of the facilities was completed. Among those facilities, the number of inpatients at the Maternity Ward, which was improved by the project in terms of facility and equipment, increased from 2,259 in 2007 to 5,089 in 2014, which showed a 2.3 times increase. Although the project also improved the Male Ward, the actual data on the number of inpatients at the Male Ward was not available, as its data was not recorded independently.

Although the bed occupancy rate (occupancy rate of inpatients) of the Maternal Ward has been fluctuating every year, it increased every year starting from 74% in 2012, and increased by 20% to 94% in 2014. The bed occupancy rate in 2010 and in 2011, before the project completion, exceeded 100%, and one bed was shared by more than one patient. As the bed occupancy rate at the Maternal Ward has been increasing without exceeding 100% since the completion of construction and equipment provision, the status has improved compared with before the project.

Hence, the number of operations, outpatients, deliveries, and inpatients increased, and the bed occupancy rate improved at Mubende R.R.H., although the number of casualties by accident was not available. Therefore, these indicators are assessed to have been achieved.

Table 7: Achievement of the Operation Indicators (Mubende R.R.H.)

Indicator	Baseline 2007	Target 2015	Actual 2010	Actual 2011	Actual 2012	Actual 2013	Actual 2014
	Baseline Year	3 Years After Completion	2 Years Before Completion	1 Year Before Completion	Completion Year	1 Year After Completion	2 Years After Completion
Number of Operations	6,465	increase	9,575	5,745	5,017	13,482	7,465
Major Operation	N/A	N/A	1,150	1,379	1,421	1,661	2,107
Minor Operation	N/A	N/A	8,425	4,366	3,596	11,821	5,358
Number of Outpatients	83,620	increase	66,283	67,340	86,715	90,155	103,013
Casualties	3,883	N/A	N/A	104	333	237	171
ENT	0	N/A	N/A	349	1,342	1,023	869
Ophthalmology	0	N/A	N/A	N/A	1,255	3,086	2,575
Number of Deliveries	2,021	increase	2,755	3,087	3,383	3,944	4,393
Normal Deliveries	1,045	N/A	1,941	2,326	2,767	3,203	3,363
Caesarean sections	963	N/A	659	761	616	741	1,030
Others	13	N/A	155	-	-	-	-
Number of Inpatients	8,064	increase	9,110	11,708	14,896	14,884	15,526
Maternity Ward	2,259	N/A	3,110	3,388	3,926	4,412	5,089
Surgical Ward	N/A	N/A	2,048	2,404	2,949	3,157	2,937

Others	N/A	N/A	N/A	5,916	8,021	7,315	7,500
Bed Occupancy Rate (%)	N/A	N/A	131	115	98	118	90
Maternity Ward	N/A	N/A	151	116	74	91	94
Surgical Ward	N/A	N/A	157	128	77	87	76
Others	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Ex-ante Evaluation, Preparatory Survey Report, Annual Health Sector Performance Report, and Hearing/Questionnaire Survey in Mubende R.R.H.

Remarks: The number of outpatients for casualties includes those for reasons other than accidents, because no data was available for outpatients for casualties (accident cases) at Mubende R.R.H.

Based on the above, the operation indicators at both R.R.H.s are regarded to have been achieved. The reasons for the achievements above are improved work flow lines by constructing new buildings to integrate facilities that used to be scattered around the premises into a certain area, and improved work efficiency, in terms of consultations/examinations and laboratory tests (refer to 3.3.2 for details).

3.3.1.2 Effect Indicators

None.

3.3.2 Qualitative Effects

In order to assess the status of "provision of prompt and appropriate medical services", which was the expected qualitative effect of the project, an interview survey based on a questionnaire was conducted with outpatients at both R.R.H.s, inpatients at the maternal ward of Mubende R.R.H., and the medical staff who participated in the seminars conducted by the project at both R.R.H.s[16].

[16] The sample size of the beneficiary survey conducted in this ex-post evaluation was 135. The interview survey based on a questionnaire was given to (1) 84 outpatients (53 at Masaka R.R.H. and 31 at Mubende R.R.H. The proportion of sexes and the generations of the respondents were as follows: 1) Outpatients at Masaka R.R.H—Out of 53 respondents, 11 were male, 41 were female, and 1 unknown. By age, 11 respondents were in their 20s, 10 were in their 30s, 8 were in their 40s, 10 were in their 50s, 12 were in their 60s, and 2 were aged 70 or older. 2) Outpatients at Mubende R.R.H—Out of 31 respondents, 14 were male and 17 were female. By age, 10 respondents were in their 20s, 6 were in their 30s, 5 were in their 40s, 4 were in their 50s, 5 were in their 60s, and 1 was aged 70 or older. All of the respondents above were either patients or guardians or attendants of patients who had ever received medical service before the project and received current medical service from Mubende R.R.H.). (2) Inpatients at Mubende R.R.H. (20 inpatients at the Maternity Ward supported by the project. The respondents were limited to the inpatients who had ever received the medical service at the Maternity Department before the project in addition to current services. By sex, 19 were female and 1 was unknown. By age, 4 were teenagers (19 years old), 10 were in their 20s, 4 were in their 30s, and 2 were in their 40s.), (3) 31 medical and maintenance staff who participated in the equipment maintenance and operation seminars conducted as a part of the soft component of the project at both R.R.H.s (18 at Masaka R.R.H. and 13 at Mubende R.R.H.). In order to avoid negative influences on the medical services provided by the hospitals, the outpatient and inpatient respondents were selected in accordance with the advice from the medical staff at each R.R.H., considering the status of patients' health condition and medical treatment. As for the selection of medical staff who participated in the seminar given by the project, both of the R.R.H.s were requested to check the list of participants to determine the staff who were still working for the R.R.H. The interview/questionnaire survey was given to all of the medical staff who were identified and available within the survey period. As the sample size was limited and they were not randomly sampled due to realistic limitations of the survey, there is a possibility that the survey results do not fully reflect the tendencies of the whole group.

3.3.2.1 Interview Survey to Outpatients (Masaka R.R.H. and Mubende R.R.H.)

In order to assess the enhancement of the medical services to outpatients brought by the improved facilities and equipment, 84 patients at the outpatient buildings of the two R.R.H.s were asked about the improvements compared with the status before the project, specifically i) the gaps in medical treatment and laboratory tests between what is needed and what is provided, ii) the time needed to wait for medical services, iii) the burden of moving among different places, and iv) the public non-medical facilities (such as washrooms, etc.). The results are shown in Table 8.

All 84 respondents chose either 5 (very much improved) or 4 (improved to some extent) in the five-point assessment in response to all of the aspects described above. Hence, the extent of the improvements by the project is recognized to be high.

Table 8: Have the Following Aspects Improved Compared with the Status before the Project?
(Outpatients at both R.R.H.s)

(Unit: person)

	Masaka R.R.H. (53 patients)					Mubende R.R.H. (31 patients)					Total (84 patients)				
	5	4	3	2	1	5	4	3	2	1	5	4	3	2	1
Gap in the medical treatment and laboratory tests between what is needed and what is provided	9	44	0	0	0	2	29	0	0	0	11	73	0	0	0
Time to wait for medical service	4	49	0	0	0	0	31	0	0	0	4	80	0	0	0
Burden of moving among different places	2	51	0	0	0	0	31	0	0	0	2	82	0	0	0
Public non-medical facilities (such as washrooms, etc.)	7	46	0	0	0	0	31	0	0	0	7	77	0	0	0

Source: Interview survey to outpatients in Masaka R.R.H. and Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,
1: Not improved at all

With regards to the responses from respective R.R.H., most of the responses at Mubende R.R.H. were 4, while most of the responses were 4 and some were 5 at Masaka R.R.H. In terms of each aspect, “the gap between the medical treatment and laboratory tests of what is need and what is provided” and “the public facilities which are non-medical facilities” had the largest number of respondents who chose 5. At Mubende R.R.H., as the washrooms and the shower

room at the maternity ward were not often utilised[17], the respondents may have been thinking about the public facilities other than the washrooms. The washrooms were not well utilised because Mubende R.R.H. prohibited their use by patients and attendants, etc., who failed to utilise flush toilets appropriately, as they were not accustomed to doing so and broke the toilets (hospital staff utilised the toilets at the time of the ex-post evaluation). The shower room was not utilised due to insufficient water supplies. However, the shower room will soon be utilised again, since the water conditions are improving.

Based on the above, the "provision of prompt and appropriate medical services" to the outpatients at both R.R.H.s has improved.

3.3.2.2 Interview Survey to Inpatients (Mubende R.R.H.)

To assess the extent of the improvements in the services provided to inpatients compared with the status before the project, interviews based on a questionnaire were conducted with 20 inpatients at the Maternity Ward at Mubende R.R.H. (only to those who had ever received medical service from the Maternity Department of Mubende R.R.H. before the project in addition to current medical services), who were asked about improvements in the facility and the care at the R.R.H. before and after their delivery. The results are shown in Table 9.

All of the respondents but one, who chose 2 (not so much improved) for the neonatal room, chose either 5 (very much improved) or 4 (improved to some extent) for all the facilities respondents were asked about. In particular, all 20 respondents selected 5 for the Labour Room, while 19 respondents chose 5 for the Delivery Room and Recovery Room in the 5-point assessment. For all of the facilities that the respondents were asked about, the results show many favourable responses, indicating that the Maternity Ward's facilities had improved significantly.

With regards to improvement of care before and after delivery at Mubende R.R.H., all of the respondents replied either 5 or 4 for the sense of security, the care before delivery, and the care after delivery. In particular, all of the respondents chose 5 for the care after delivery, while 16 out of 20 respondents chose 5 for the care of the new-born baby (while 1 respondent chose 2). Hence, many responses showed that the care had improved (although it cannot be concluded that the results reflect the tendencies of all of the inpatients of the Maternity Ward at Mubende R.R.H. due to the small sample size).

[17] Observation at the site and interview at Mubende R.R.H.

Table 9: Have the Facilities for Delivery Improved after the Project?

（Unit: person）

	5	4	3	2	1	0
Labour Room	20	0	0	0	0	0
Delivery Room	19	1	0	0	0	0
Recovery Room	19	1	0	0	0	0
New-born Nursery Room	15	4	0	1	0	0
Building (of Maternity Department)	12	8	0	0	0	0
Hospital rooms at Maternity Ward	13	7	0	0	0	0

Source: Interview Survey to Inpatients of Maternity Ward at Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved, 1: Not improved at all, 0: I don't know

Table 10: Has the Care before and after Delivery at the Hospital Improved after the Project?

（Unit: person）

	5	4	3	2	1	0
Sense of security	6	14	0	0	0	0
Care before delivery (at the hospital)	15	5	0	0	0	0
Care after delivery (at the hospital)	20	0	0	0	0	0
Care of new-born baby	16	1	0	1	0	2

Source: Interview Survey to Inpatients at Maternity Ward, Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved, 1: Not improved at all, 0: I don't know

3.3.2.3 Interview Survey of Medical Staff Who Attended the Seminar Conducted by the Project (Masaka R.R.H. and Mubende R.R.H.)

To determine the improvement of medical services compared with the situation before the project, the following questions were asked to 31 medical staff members[18] who participated in the seminars implemented as a part of the project's soft component: i) efficiency of work due to the change in flow line in the new building, ii) receiving emergency patients, iii) hygiene of beds and infection control, and iv) occurrence of medical accidents and near-misses, etc., at both R.R.H.s. The results are shown in Table 11 and 12.

[18] This is the total number of medical staff members who still remained at the two R.R.H.s after receiving the user training on equipment maintenance and operation from the project, and who were not on official trips or long-term leave at the time of the ex-post evaluation.

Table 11: Have the Following Points Improved after the Project?
(Medical Staff Who Participated in the Seminar at Masaka R.R.H.)

（Unit: person）

	Masaka R.R.H. (18 staff)					
	5	4	3	2	1	0
Efficiency of work for handling outpatients (due to the change in flow line in the new building)	4	11	0	0	0	3
Efficiency of work in laboratory tests (due to the change in flow line in the new building)	8	10	0	0	0	0
Efficiency of work for handling patients before/after operation (due to change in flow line)	13	4	1	0	0	0
Receiving emergency patients	10	8	0	0	0	0
Hygiene of beds and infection control	3	11	0	2	1	1
Occurrence of medical accidents and near-misses	8	4	5	0	1	0

Source: Interview Survey to the Medical Staff (participants of the seminar) at Masaka R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don’t know

Table 12: Have the Following Points Improved after the Project?
(Medical Staff Who Participated in the Seminar at Mubende R.R.H.)

（Unit: person）

	Mubende R.R.H. (13 staff)					
	5	4	3	2	1	0
Efficiency of work for handling outpatients (due to the change in flow line in the new building)	4	8	0	0	0	1
Efficiency of work in laboratory tests (due to the change in flow line in the new building)	7	6	0	0	0	0
Efficiency of work for handling patients before/after operation (due to change in flow line)	9	4	0	0	0	0
Receiving emergency patients	6	7	0	0	0	0
Hygiene of beds and infection control	3	7	1	1	0	1
Occurrence of medical accidents and near-misses	6	4	3	0	0	0

Source: Interview Survey to the Medical Staff (participants of the seminar) at Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved,

1: Not improved at all, 0: I don’t know

All of the respondents from both R.R.H.s chose either 5 or 4 in the 5-point scale for “Efficiency of work for handling outpatients (due to the change in flow line in the new building)”, “Efficiency of work in laboratory tests (due to the change in flow line in the new building)”, and “Receiving emergency patients”. Also, all of the respondents, except for one who chose 3, selected either 5 or 4 for “Efficiency of work for handling patients before/after operation (due to change in flow line)”. Hence, many respondents recognised that these points

had improved. As for “Occurrence of medical accidents and near-misses”, all of the respondents, except for the one who chose 1, selected 3 or higher. Concerning the occurrence of medical accidents and near-misses, comprehensive information was not available, since no reporting system has been established. However, it is supposed, at least, that no medical accidents or near-misses resulted from the provided equipment[19]. As for “Hygiene of beds and infection control”, on the other hand, the responses varied, i.e., 3 respondents chose 2 and 1 selected 1.

Thus, the efficiency of work and the handling of patients, which are directly connected with improvements in facilities and equipment, such as the efficiency of work in handling outpatients, laboratory tests, and receiving emergency patients, improved after the project, although the quality and efficiency of the tasks for which knowledge and skills are important, in addition to better facilities and equipment, did not necessarily improve.

Additionally, some comments were received from another interview[20] conducted with medical staff at both R.R.H.s, such as “The quality of the equipment provided by the project is high”, “The resuscitator has been helpful to save lives of the patients”, and so on. These comments suggest that the equipment provided has contributed to enhancing the quality of medical services. On the other hand, however, there were some other comments such as “The suction unit sometimes overcharges” and “No electricity back-up system is equipped with the anaesthesia machine”.

3.3.2.4 External Conditions

Several elements could have influenced the medical services of the two R.R.H.s beyond the project’s effects, such as changes in access to the R.R.H.s, the construction of new hospitals nearby, and support from other donors to the R.R.H.s, etc. No significant changes have been observed concerning access to the R.R.H.s, and the number of R.R.H.s in the central Uganda was the same as before. As for the donors’ support to the R.R.H.s, Mubende R.R.H. was one of the target hospitals of the World Bank’s “Uganda Health System Strengthening Project II (2010-2017)” and received some equipment, which is regarded to have had complementary effects on the project and included: 3 incubators, 2 infant warmers, 2 phototherapy units, 4 vacuum extractors (2 electric and 2 manual), 6 weighing scales (1 for infants and 5 for children), 2 instrument sets for basic Caesareans, 2 instrument sets for dilation and curettage, 2 examination couches for gynaecology, etc., as well as furniture[21].

[19] Interviews at both R.R.H.s

[20] Two medical staff members from each R.R.H. were interviewed. Interviews were conducted with a nurse, a mid-wife, a senior nurse, and a doctor.

[21] Although Mubende R.R.H. itself received much more equipment from the World Bank project, it was not clear which equipment was allocated to which department. Enquiry on this point was made to Mubende R.R.H., etc. but no further information was available. Therefore, the equipment which is regarded to be used only at obstetrics and gynaecology was picked up from the list of equipment and furniture from the World Bank project to Mubende R.R.H. Thus, there is possibility that more equipment was provided to the Maternity Department, as some other

As stated above, the work flow line was improved through the construction of a new building to integrate some old ones, which used to be scattered around in the premises. The new building improved outpatient examination and laboratory tests, decreased patients' waiting time for examination, made moving around the premises less cumbersome, and narrowed the gap between the needs of the patients and the medical services provided. These factors led to an enhanced reliability of the R.R.H.s from the patient's point view as well. Therefore, 'provision of prompt and appropriate medical services', the qualitative effects of the project expected at the time of planning, is assessed to have been enhanced.

3.4 Impacts

3.4.1 Intended Impacts

3.4.1.1 Quantitative Effect

(1) Number of Patients Referred from Lower Level Hospital[22]

This project aims to enhance the local medical referral system by improving medical service through improvement of facility and equipment of both R.R.H.s. The number of patients received from lower-level hospitals, which shows the quantitative effect of the expected impact, increased every year, drastically increasing since 2012, when construction of the new buildings was completed, except for at Mubende R.R.H. in 2013. As stated regarding effectiveness, the medical service provided by both R.R.H.s has been enhanced through the project's improvement of facilities and equipment. Hence, it is regarded that increased patient trust brought about by the project led to the increase in the number of patients referred from lower-level hospitals. Thus, it is assessed that the referral system was improved by the project.

Table 13: Number of Patients Referred from Lower-Level Hospitals

(Unit: person)

	2010	2011	2012	2013	2014
Masaka R.R.H.	724	935	2,077	3,149	3,121
Mubende R.R.H.	N/A	116	875	611	669

Source: Questionnaire Survey to Masaka R.R.H. and Mubende R.R.H.

equipment which can be commonly used by different departments was also provided to the Maternity Department of the R.R.H. As for the furniture, there is no information sufficient to judge which one was allocated to the Maternity Department.

[22] At the time of planning, 'Improvement of Secondary Medical Services as a Referral Hospital' was stated as one of the expected indirect effects of the project (Preparatory Survey Report). Also, the Ex-ante Evaluation paper stated that 'the project aims to contribute to improvement of local medical referral system by improving medical service through strengthening functions of both R.R.H.s').

(2) Health Indices in the Catchment Area of Mubende R.R.H.[23]

Maternal mortality ratio, infant mortality rate, and under 5 years old mortality rate—the major health indices in the catchment area of Mubende R.R.H., whose Maternity Department was supported by the project's improvement of facilities and equipment—did not show significant improvements compared to those indices before the project's implementation. The improvement of health indices of Uganda such as infant mortality rate and maternity mortality rate was expected as a project's impact at the ex-ante evaluation. However, it is not possible to assess the project's impact on the health indices, maternity deaths, and stillbirths at Mubende R.R.H. by analysing these data, since those indices and the number vary depending on other external factors, such as the improvement status of lower-level hospitals, and so on.

Table 14: Health Indices in the Catchment Area of Mubende R.R.H.

(Unit: person)

	2010	2011	2012	2013	2014
Maternal mortality ratio (per 100,000 live births)	994	938	602	916	622
Infant mortality rate (per 1,000 live births)	13	27	38	27	26
Under 5 years old mortality rate (per 1,000 live births)	70	54	42	23	29

Source: Questionnaire Survey to Mubende R.R.H.

Remarks: The ex-post evaluation found that the maternal mortality ratio was 343 per 100,000, the infant mortality rate was 38 per 1,000 live births, and the less than 5 years old mortality rate was 55 per 1,000 live births in Uganda (World Bank).

(3) Number of Maternal Deaths and Stillbirths in Mubende R.R.H.

Information on the maternal mortality ratio against the number of deliveries, and the ratio of stillbirths among all of the deliveries at Mubende R.R.H. were collected to examine any changes after the project. No significant tendencies towards improvement were observed. Thus, the impact on these points has not emerged.

Table 15: Number of Maternal Deaths and Stillbirths in Mubende R.R.H.

	2007	2010	2011	2012	2013	2014
Number of Maternal Deaths (persons)	96	25	26	19	34	26
Number of Deliveries	2,021	2,755	3,087	3,383	3,944	4,393

[23] At the time of planning, 'improvement of healthcare indices of Uganda', such as infant mortality rate and maternal mortality rate, was indicated as one of the expected indirect effects of the project (Preparatory Survey Report). Since the project's target hospitals are limited to two R.R.H.s in the Central Region, among other hospitals in Uganda, the areas of the health indices were changed to those in the catchment area of the target R.R.H. instead of the whole area in Uganda, in order to check the project's direct influence. Also, the indices set at the planning stage are regarded to have been directly related to maternal department, for which Mubende R.R.H. was supported by the project. Therefore, assessment on this point was made, focussing on the health indices in the catchment area of Mubende R.R.H.

Maternal Mortality Rate against the Number of Deliveries (%)	4.8	0.9	0.8	0.6	0.9	0.6
Number of Stillbirths	140	284	256	294	261	329
Stillbirth Rate against the Number of Deliveries (%)	6.9	10.3	8.3	8.7	6.6	7.5

Source: Questionnaire Survey in Mubende R.R.H.

(4) Death rate of patients for casualties

Analysis was made on the number of patients received for casualties (accident cases) and deaths to examine the effects the improved facility and equipment had on the Casualty Department. The death rate among patients received slightly increased at Masaka R.R.H. since 2012, when the data first became available. However, the death rate of received patients is closely connected with the seriousness of each patient's injury; it should be noted that it also varies depending on such as the improvement of lower-level hospitals' ability to receive patients for casualty, increases in traffic accidents, and so on. At Mubende R.R.H., these data do not exist. Therefore, the effect of improving the Casualty Departments at both R.R.H.s could not be confirmed.

Table 16: Death Rate of Patients for Casualties (Masaka R.H.H. and Mubende R.R.H.)

Indicator	Baseline 2007	Target 2015	Actual 2010	Actual 2011	Actual 2012	Actual 2013	Actual 2014
	Baseline Year	3 Years After Completion	2 Years Before Completion	1 Year Before Completion	Completion Year	1 Year After Completion	2 Years After Completion
Masaka R.R.H.							
Number of deaths in Casualty Dept. (Accident cases; persons)	N/A	N/A	N/A	N/A	137	160	209
Death rate in Casualty Dept. (Accident cases; %)	N/A	N/A	N/A	N/A	0.9%	1.1%	1.2%
Mubende R.R.H.							
Number of deaths in Casualty Dept. (Accident cases; persons)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Death rate in Casualty Dept. (Accident cases; %)	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: Ex-ante Evaluation, Hearing/Questionnaire Survey in Masaka R.R.H. and Mubende R.R.H.

3.4.1.2 Qualitative Effect

(1) Improvement of Medical Services for Approximately 2.55 Million People in the Catchment Area

At the planning stage of the project, 'Improvement of medical services for approximately 2.55

million people in the catchment area'[24] was indicated as one of the expected indirect effects of the project. However, there is a gap between the 2.55 million people, shown as the number of beneficiaries, and the number of patients who actually received medical services from the two R.R.H.s. Hence the number, 2.55 million, does not have substantial meaning as the project's qualitative effect. On the other hand, those who actually received medical services from the two R.R.H.s are the actual number of patients, the data of which have been already covered and analysed as an operation indicator for assessing effectiveness. Therefore, this indicator is not used as a qualitative indicator for assessing impact.

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

Neither positive nor negative impacts of the project have been observed with regards to the natural environment.

(2) Land Acquisition and Resettlement

None.

(3) Unintended Positive/Negative Impact

As an R.R.H. is expected to function as an educational institution to accept medical staff as trainees in Uganda, nurses, health workers and laboratory technicians, etc. from local technical schools have been received for training for improving their skills in laboratory tests and medical services[25]. According to the interviews conducted with the staff at both R.R.H.s concerning the change in terms of the number of trainees and the training contents. According to the respondents, the training contents were enhanced by the improved equipment, but information on specific differences or related documents were not available. The project's influence on 'the improvement of the training of medical staff at hospitals in Uganda in terms of operation and maintaining equipment,' i.e., one of the expected effects of this project's soft component, could not be observed.

No negative impacts from the project were observed either.

As stated above, this project has largely achieved its objectives. Therefore, effectiveness and impact are high.

[24] Preparatory Survey Report
[25] Preparatory Survey Report

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

Each hospital maintains its facility with its own budget. The Ministry of Health's Central Workshop supervises equipment maintenance for Masaka R.R.H., while Mubende R.R.H. has been responsible for its equipment maintenance since 2013, when the maintenance workshop was established. Maintenance of sophisticated equipment, such as X-ray machine and ICU equipment, etc. is not covered by the Central Workshop, because a specific budget is provided to the hospitals by the Ugandan government or other donors[26]. The Maintenance Unit is responsible for maintenance at Masaka R.R.H., and the Maintenance Workshop is responsible at Mubende R.R.H. It is clear where the responsibilities rest within the R.R.H. and between the R.R.H. and the organizations concerned, although there was a slight change compared to the planning stage.

Basically, maintenance is conducted by the sections mentioned above at each R.R.H. to address a problem upon receiving information about it from another section[27]. Periodic inspection now is conducted at both R.R.H.s over a certain timeframe, which was not routinely done before the project's implementation[28].

As a part of the project's soft component, an organization chart of equipment maintenance systems in each R.R.H. was formulated, the name of the person responsible for maintenance was confirmed, and the collaborative relationships between the R.R.H. and the Central Workshop were clarified during the implementation period. During the ex-post evaluation, however, the results were not shared among those concerned, and thus, the system did not survive. On the other hand, there were no substantial problems at the time of the ex-post evaluation, because the maintenance structure had been established after members were assigned from each section to the maintenance team, which was to collaborate with the Maintenance Unit at Masaka R.R.H, and after the Maintenance Workshop had been established at Mubende R.R.H.

The Defect Inspection of June 2013, which ranks on a scale from *A* (highest) to *C* (lowest), assessed that securing human resources for the maintenance system at Masaka R.R.H. was an *A* (i.e. human resources are secured) while that of Mubende R.R.H. was a *B* (i.e. there is a room for improvement)[29]. At the time of the ex-post evaluation, the number of maintenance staff at Mubende R.R.H. had increased from one to three. Masaka R.R.H.'s Maintenance Unit also grew, compared to the time of the Defect Inspection. However, the questionnaire survey shows that both R.R.H.s still recognise the number of maintenance staff is still insufficient[30].

[26] Questionnaire survey to the Central Workshop, Ministry of Health
[27] Questionnaire and Interview to/at both R.R.H.s and Ministry of Health
[28] JICA internal document
[29] JICA internal document
[30] Questionnaire survey to both R.R.H.s

Table 17: Number of Staff at Masaka R.R.H.

(Unit: person)

	2011	2012	2013	2014
Management	N/A	N/A	1	1
Medical Staff	N/A	N/A	160	128
Administration Staff	N/A	3	2	2
Maintenance Staff	N/A	3	3	3
Total	N/A	N/A	166	134

Source: Questionnaire Survey to Masaka R.R.H.

Remarks: Above figures include only the staff whose salary is paid by the hospital.

Table 18: Number of Staff in Mubende R.R.H.

(Unit: person)

	2011	2012	2013	2014
Management	0	0	1	1
Medical Staff	93	88	93	108
Administration Staff	2	2	2	3
Maintenance Staff	1	1	1	3
Total	96	91	97	115

Source: Questionnaire Survey to Mubende R.R.H.

Remarks: Above figures include only the staff whose salary is paid by the hospital.

With regards to the change in hospital staff from the viewpoint of the management system as a whole hospital, the number of staff (mainly, medical staff) at Masaka R.R.H. decreased beginning 2 years ago, when the data were available, due to transfer and retirement. At Mubende R.R.H., the number has increased over the last four years, although it fluctuated depending on the year. It should be noted that the number of staff at Mubende R.R.H. was smaller than that of Masaka R.R.H. even before the project, and it is still smaller than Masaka R.R.H. after the staff number increased (Table 17 and 18). However, the number of medical staff at Mubende R.R.H. has improved after receiving the support of the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) Project (2004-2017), which allocated 29 medical staff (nurses, midwives and clinical officers whose salary is paid by PEPFAR and who will be hired by Mubende R.R.H. as permanent staff after 3 years) beginning in January 2016. According to the beneficiary survey, however, the management staff of both R.R.H.s recognise that the number of hospital staff is still insufficient.

As mentioned above, the division of duties and organisational structure to maintain both the R.R.H.s and the organisations concerned are clear, regular inspection has been conducted at a certain intervals, and the number of maintenance staff has increased, although the number is still small. Although the total number of the hospital staff is insufficient, other donors' support to increase the number of staff is also observed. Therefore, sustainability in terms of the

institutional aspects of operation and maintenance is high.

3.5.2 Technical Aspects of Operation and Maintenance

An interview was conducted based on a questionnaire with 31 seminar participants (18 at Masaka R.R.H. and 13 at Mubende R.R.H.) concerning knowledge on equipment operation and maintenance offered through the project's soft component. The result is as follows: regarding the establishment of knowledge and skills acquired through the seminar, 14 of 18 respondents at Masaka R.R.H. and 10 of 13 at Mubende R.R.H. chose either 5 (yes, very much) or 4 (yes, to some extent) on the 5-point rating. On the other hand, there were some comments from the respondents and those who were concerned that the medical staff's capacity of equipment operation and maintenance was not sufficient, due to the increase of those who were not trained resulting from the transfer and retirement of some participants. Thus, the level of knowledge and skills use at the time of ex-post evaluation is rather high. Also, with regards to use of the manuals, all 18 respondents at Masaka R.R.H. and 12 out of 13 at Mubende R.R.H. selected either 5 or 4 on the 5-point rating. Hence, the manuals have been used well.

Table 19: Seminar Participants' Knowledge of Equipment Operation and Maintenance (Masaka R.R.H.)

(Unit: person)

	5	4	3	2	1	0
Do you still remember the knowledge/skills on use/operation and maintenance of equipment acquired through the seminar?	7	7	0	4	0	0
Do you still utilize the manual produced and distributed at the seminar now?	8	10	0	0	0	0

Source: Interview Survey to the Medical Staff (participants of the seminar) at Masaka R.R.H.

Remarks: 5: Yes, very much, 4: Yes, to some extent, 3: Medium, 2: Not so much, 1: Not at all, 0: I don't know

Table 20: Seminar Participants' Knowledge of Equipment Operation and Maintenance (Mubende R.R.H.)

(Unit: person)

	5	4	3	2	1	0
Do you still remember the knowledge/skills on use/operation and maintenance of equipment acquired through the seminar?	3	7	0	2	0	1
Do you still utilise the manual produced and distributed at the seminar now?	9	3	0	0	0	1

Source: Interview Survey to the medical staff (participants of the seminar) at Mubende R.R.H.

Remarks: 5: Yes, very much, 4: Yes, to some extent, 3: Medium, 2: Not so much, 1: Not at all, 0: I don't know

Also, two internal trainers from Masaka R.R.H.'s medical staff were fostered by the JICA Technical Cooperation Project, 'Project on Improvement of Health Service through Health Infrastructure Management' (2011 - 2014), to enhance the medical staff's capacity of operation and maintenance, which complementarily affected the project[31]. Maintenance training at Masaka R.R.H. was delivered by the internal trainer for nurses once (24 participants in 2014), while training was conducted twice at Mubende R.R.H. (once in 2013, and 2014, respectively). At Mubende R.R.H., a person in charge of the Maintenance Workshop and a dispatched Japan Overseas Cooperation Volunteers (JOCV) member were assigned as internal trainers by the hospital. Although both R.R.H.s expressed their intention to continue implementing internal training in the future, specific information on the details of the implemented training and its effects, the schedule and number of trainings planned was not available.

In the meantime, the issues pointed out at the Defect Inspection, which will be explained later in 3.5.4., i.e., Current status of operation and maintenance, have not improved much. Insufficient knowledge and awareness from cleaning companies' cleaners, who are connected to many of the issues, are some of the causes which have prevented the hospitals from executing instruction and guidance, leading to rusted equipment. Also, leaving blood on the floor of the Operation Theatre Building, as observed at Mubende R.R.H., is an issue of infection control, which is a concern regarding the improvement of medical services (i.e. the project objective). Although additional orders of shoes for the Operation Theatre Building were already made and pad provision for pregnant women has been considered at Mubende R.R.H., the countermeasures to prevent infection are not possible to be assessed as sufficient.

Based on the above, sustainability in terms of technical aspects of operation and maintenance is fair, as some minor problems were observed.

3.5.3 Financial Aspects of Operation and Maintenance

At the time of the Defect Inspection in June 2013, 'securing maintenance budget was rated as *A* (i.e. budget is secured) at Masaka R.R.H. and *B* (i.e. there is a room for improvement) at Mubende R.R.H. by three-grade assessment.[32] On the other hand, the government budget and expenditure-for-maintenance cost have been increasing every year since 2010, especially at Mubende R.R.H. since 2013, when its Maintenance Workshop was established. Hence, Mubende R.R.H.'s *B* rating from the Defect Inspection is assessed to have already been improved. As for the annual financial balance of both R.R.H.s after 2010, the amount of revenue has been increasing steadily at Mubende R.R.H. every year, while the government budget

[31] Interview at Masaka R.R.H. The trainers fostered by the technical cooperation project consist of one nurse and one midwife.
[32] JICA internal document

increased except in 2012 and 2013 at Masaka R.R.H. The medical service fee[33] also has been on the increase at Masaka R.R.H. At Masaka R.R.H., a part of the medical service fee has been allocated for maintenance costs in addition to the government budget since 2010, and the amount allocated from medical service fee also increased every year. As the financial balance has been in the black except for 2010 at Masaka R.R.H. and the balance has been zero (i.e. not deficient) at Mubende R.R.H., neither R.R.H. seems to have financial problems as a public hospital.

Table 21: The Government Budget and Financial Balance at Masaka R.R.H.

(Unit: Millions Ugandan Shilling)

	2010	2011	2012	2013	2014
Total Revenue	**4,839**	**4,950**	**4,643**	**4,385**	**5,091**
Government Budget	4,551	4,612	4,298	4,072	4,742
Medical Service Fee	288	338	345	313	349
Total Expenditure	**4,849**	**4,624**	**4,315**	**4,094**	**4,764**
Human Resources	2,270	2,282	2,437	2,468	2,520
Maintenance Cost	56	107	103	123	128
From Government Budget	46	95	86	101	106
From Medical Service Fee	10	12	17	22	22
Others	2,523	2,235	1,775	1,503	2,116
Balance	**-10**	**326**	**328**	**291**	**327**

Source: Based on Questionnaire and Interview Survey at Masaka R.R.H.

Remarks: 1 Ugandan shilling was 0.043 Yen (JICA monthly exchange rate, December 2014, JICA web page)

Table 22: The Government Budget and Financial Balance at Mubende R.R.H.

(Unit: Millions Ugandan Shilling)

	2010	2011	2012	2013	2014
Total Revenue	**2,041**	**2,337**	**2,393**	**3,574**	**3,926**
Government Budget	2,041	2,337	2,393	3,574	3,926
Total Expenditure	**2,041**	**2,337**	**2,393**	**3,574**	**3,926**
Human Resources	958	1,408	1,502	1,807	2,138
Maintenance Cost	27	23	27	70	130
Others	1,056	906	864	1,697	1,658
Balance	**0**	**0**	**0**	**0**	**0**

Source: Questionnaire and Interview Survey at Mubende R.R.H.

The Ministry of Health's Central Workshop's maintenance budget[34] also has been increasing every year since 2010. Although the Central Workshop's budget for Masaka R.R.H. and

[33] At Masaka R.R.H., the Private Ward was constructed with the government budget; this was not constructed at Mubende R.R.H. In Uganda, medical services are basically free of charge at public hospitals, except for those at the Private Ward of some of the public hospitals. Thus, only some of the public hospitals which have a Private Ward receive revenue from the medical service fee.

[34] The government-budget amounts in Tables 21 and 22 show the budget allocated by the Ministry of Health. However, the Central Workshop has its own separate budget for maintenance of each hospital.

Mubende R.R.H. increased in 2014 compared to 2010, the amount fluctuated during the years in between, which does not show a consistently increasing tendency. There is no special change foreseen in terms of annual budget, revenue, and expenditure in the future.

Table 23: Budget of the Central Workshop of the MOH for Maintenance

(Unit: Millions Ugandan Shilling)

	2010	2011	2012	2013	2014
Total Budget	**128**	**128**	**380**	**476**	**680**
Masaka R.R.H.	10	7	4	11	15
Mubende R.R.H.	7	5	3	9	11
Other Hospitals/HCs	63	77	312	430	541
Others	48	39	61	26	113

Source: Questionnaire Survey to Central Workshop of the MOH

As stated above, the sustainability in terms financial aspect of operation and maintenance is high.

3.5.4 Current Status of Operation and Maintenance

An interview survey based on a questionnaire was conducted at both R.R.H.s with the medical staff who participated in the equipment operation and maintenance seminar organised as a part of the soft component of the project. Some questions were asked on the status of equipment maintenance at the time of ex-post evaluation compared to before the project. As the results, 25 out of 31 respondents rated either 5 (very much improved) or 4 (improved to some extent) on the 5-point assessment. Thus, many of the medical staff who participated in the equipment maintenance seminar at both R.R.H.s recognize that the status of operating and maintaining equipment improved compared to before project implementation.

Table 24: Has Maintenance of the Provided Equipment Improved Compared to Before?
(Medical staff who participated in the seminars at both R.R.H.s)

（Unit: person）

	5	4	3	2	1	0
Masaka R.R.H.	5	10	0	1	0	2
Mubende R.R.H.	6	4	3	0	0	0
Total	11	14	3	1	0	2

Source: Interview Survey to the Medical Staff (participants of the seminar) at Masaka R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved, 1: Not improved at all, 0: I don’t know

3.5.4.1 Current Status of Equipment Operation and Maintenance

As for the equipment provided, although it was mostly well utilized, some of the equipment

was out of order (1 electrosurgical unit, 1 pulse oximeter at Masaka R.R.H., and 1 out of 2 autoclaves, vertical, at Mubende R.R.H.), unused due to unavailability of spare parts (water softener[35] at Mubende R.R.H.), used without some spare parts due to unavailability (operating lights without bulbs at Mubende R.R.H., and hand-washing water steriliser at Masaka R.R.H.), or underused although it was not broken (C-arm X-ray unit at Masaka R.R.H.). The incubator at Mubende R.R.H., which had not been used at the time of the Defect Inspection since the fatal accident, was used at the time of ex-post evaluation, because knowledge on how to use it was internally shared afterwards.

3.5.4.2 Current Status of Facilities Operation and Maintenance

With regards to the facilities, the toilet was not used by the patients at Mubende R.R.H. because it was clogged with paper, and the patients and attendants broke the toilet because they were not accustomed to using a flush toilet. Thus, Mubende R.R.H. decided to limit toilet use to the hospital staff only. The patients use vault toilets, which existed at the premises before the project. The shower room at the Maternity Ward has not been used either, due to water supply problems on the Ugandan side. However, the water supply problem is expected to be solved soon.

Meanwhile, the issues pointed out at the Defect Inspection had not improved much at the time of ex-post evaluation. At the time of the Defect Inspection, considerable numbers of problems occurred at both R.R.H.s because the advice given at the time of the handover was not followed afterwards. Consequently, at the time of the Defect Inspection, some advices were given by the inspector to the R.R.H.s, such as do not excessively wash the room floor, which leads to exfoliation of the PVC sheets on the floor, rust on metallic materials, and short circuiting of electric appliances; do not use detergent which leads to rust on metallic materials to wash the floor; do not put equipment directly on the floor in order to avoid damage; and do not flush non-excretions to avoid clogging the toilets[36]. However, according to the questionnaire and interview survey conducted at the time of ex-post evaluation, the status of these factors has not improved (Table 25).

[35] According to the interview conducted at Mubende R.R.H., there was an explanation for why the water softener was not used: the required salt and reagent were not available at the local market. Although the inspector at the Defect Inspection notified the R.R.H. that the salt available at the local market can be substituted [JICA internal document], the R.R.H. still recognized that the equipment could not be operated without Japanese salt

[36] JICA internal document

Table 25: The Status at the Time of Ex-Post Evaluation of the Issues Pointed Out at the Defect Inspection

Issues pointed out	Masaka R.R.H.	Mubende R.R.H.
Do not excessively wash the floor with water, but use a mop	2	3
Wax the PVC sheets	1	3
Do not use acidic liquid detergent	1	3
Do not put equipment directly on the floor	3	4
Do not throw stuff into water closet of the toilet and sink except for filth originally designed for use	2	3

Source: Questionnaire Survey to Masaka R.R.H. and Mubende R.R.H.

Remarks: 5: Very much improved, 4: Improved to some extent, 3: Medium, 2: Not so much improved, 1: Not improved at all, 0: I don't know

As mentioned above, many of the issues are related to cleaning. Cleaning of the hospital facilities is outsourced to cleaning companies. Specific instructions on to improve the problems pointed out at the Defect Inspection depend on each R.R.H.; sufficient instruction has not been given to the cleaners at Masaka R.R.H., but instruction/guidance was given to the cleaners at Mubende R.R.H., though the cleaners have not executed the instructions. Among the issues raised, the use of acid detergent is difficult to change, as the detergent's use is designated by the government. However, improvement is expected if the detergent is appropriately diluted before use or ethanol (diluted by 70 - 90%) is used. However, the latter option is practically impossible for hospitals to execute, as ethanol is not supplied[37].

Also, it was observed that patient blood was left on the floor of the Operation Theatre along the route of the patient entrance to the operating room at Mubende R.R.H. The number of shoes for the Operation Theatre is also insufficient. Although an order for additional shoes has been made, countermeasures for infection control are regarded to be insufficient.

Thus, medium-level problems have been observed in terms of the current status of operation and maintenance.

As stated above, some minor problems in terms of the technical aspect of the operation and the maintenance system, and some medium-level problems in terms of the current status of operation and maintenance have been observed. Therefore the sustainability of the project's effects is fair.

[37] Interview at Mubende R.R.H.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The objective of this project is to enhance the medical services offered by Masaka R.R.H. and Mubende R.R.H., the secondary referral hospitals, by improving the facilities and medical equipment of the both R.R.H.s in the Central Region in Uganda, thereby contributing to the improvement of the local medical referral system.

Uganda has been seeking better access to high-quality medical service by hospitals, with special emphasis on enhancing regional referral hospitals. However, Uganda's major health indices are still at the most seriously low level worldwide, like other African nations. Thus, the project is highly consistent with Uganda's development policy and development needs. Also, the project is highly consistent with the aid policy of Japanese government and JICA, since "health and infrastructure" is included in "improvement of basic well-being", one of the priority areas of the Japan's Official Development Assistance (ODA) policy for Uganda. Therefore, the relevance of the project is high. The outputs were produced in accordance with the plan, and the project's cost was within the plan. However, the project's duration exceeded the plan. Therefore, its efficiency is fair. By improving facilities and equipment, the number of operations and outpatients at both hospitals increased, while the number of deliveries and inpatients as well as the bed occupancy rate also increased at the Maternity Department of Mubende R.R.H., which was supported by the project. Moreover, satisfaction of patients and medical staff also increased due to the improved facilities and equipment. Additionally, the number of patients referred from the lower level hospitals increased at both hospitals. Therefore, the effectiveness and impact of the project are high. On the other hand, the sustainability of the project is fair, since some minor problems in terms of technical aspects and some medium-level problems in the current status of operation and maintenance are observed, although no problems are seen in terms of the institutional and financial aspects of operation and management.

In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Improvement of the Issues Pointed Out at the Defect Inspection

The status of the issues pointed out at the Defect Inspection has not improved much (e.g. wipe the floor with a mop in order to avoid excessive washing, wax the PVC sheets, avoid using strong acid detergent, avoid putting equipment directly on the floor, etc.), which leads to equipment rusting among other problems. Mubende R.R.H.s is considering some countermeasures, such as using pallet to avoid putting equipment directly on the floor. In addition, it is necessary for both R.R.H.s to take immediate action to improving the problems pointed out at the Defect Inspection, including diluting acid detergent appropriately and using

ethanol (70–90% concentration) and so on, among others.

(2) Improvement of Infection Control and Awareness Raising

It was observed at the time of on-the-spot check the number of shoes for the Operation Theatre Building was insufficient, and some blood was left on the floor of the Operation Theatre Building along the entrance route to the operation room at Mubende R.R.H. For this, it is confirmed that the R.R.H. has ordered additional shoes for the Operation Theatre and now is considering providing pads to pregnant women, etc. In addition, it is necessary for Mubende R.R.H. to establish a cleaning system which enables quick action to prevent blood being left on the floor and raise the hospital staff's and cleaners' awareness of infection control.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

<u>- Minimizing Risks of Nosocomial Infection in Tandem with Technical Cooperation</u>

The project was implemented with the aim of enhancing medical services by improving the R.R.H.s' existing facilities and equipment provisions. However, there are still some concerns in terms of infection control, such as blood being left on the floor of Operation Theatre Building. Since the project is a grant-aid project, knowledge and awareness of infection control, which largely influence medical service enhancement, are uncontrollable external risks that affect the project's outcomes. However, in addition to improving the maintenance skills of the equipment, it is vital for enhancing medical services by using the improved facilities and provided equipment to improve knowledge and raise awareness among those who are concerned. Those include medical staff members who provide medical services, cleaners who are outsourced, and management staff members who make decisions on strengthening internal structure. Therefore, in order to improve medical services, it is necessary for JICA to combine a grant aid project with technical cooperation starting from the planning stage to enhance capacity of medical staff and so on, including enhancement of knowledge and awareness of the staff on infection control and so on, instead of support by a grant aid alone.

Republic of South Africa

FY2015 Ex-Post Evaluation of Technical Cooperation Project

"Capacity Building of Medical Equipment Maintenance and Management in Southern Africa"

External Evaluator: Kozue Amemiya

Foundation for Advanced Studies on International Development

0. Summary

The project was implemented to improve medical equipment maintenance and management (hereafter, MEMM) in the Republic of South Africa (hereinafter South Africa) by providing a holistic model that contains the development of a training system for clinical technicians[1] in order to build the capacity of MEMM and by strengthening the organizational structure for MEMM in Eastern Cape Province, the pilot province, and by utilization of the developed model by other provinces.

The project was consistent with the development policy and development needs of South Africa, the aims of which were to secure health technology, develop human resources and improve the health system from the time of planning to the project completion. In addition, the project's consistency with Japan's ODA policy was also high because the policy gave priority to capacity development in the health sector at the time of planning. As a result of the revision of the Project Design Matrix[2] (hereafter, PDM)[3], with a reduction in the number of activities performed, the project design was not coherent from its activities and outputs to the project purpose, and this had a negative effect on the effectiveness and impact of the project. Hence, its relevance is fair. Each output was not achieved either and activities such as the consultation were not sufficient to adopt the project's model in other provinces. Therefore, the project purpose was not achieved. The overall goal was not achieved either because no activities have been performed since the completion of the project. Thus, the effectiveness and impact of the project are low. The project period was extended and the project cost exceeded the planned amount because of the additional equipment provision; however, these additional inputs did not contribute to an increase in the output. Hence, the efficiency of the project is low. Although sustainability in terms of the policy aspect is high, some major problems have been observed in terms of the organizational and technical aspects of the

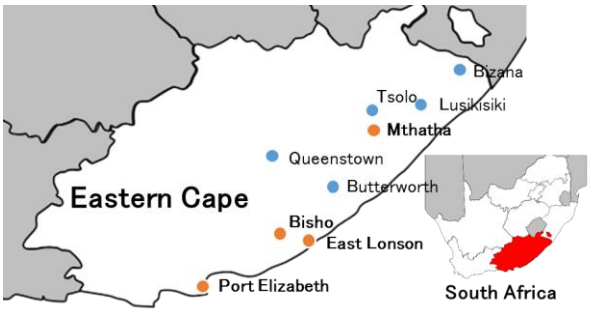
[1] It requires the qualification of an "engineering diploma" to be recognized as a "technician" in South Africa. Bachelor's degree holders such as "bachelor of science in engineering" and "bachelor of engineering" are recognized as a "engineer." However, there are many staff who engage in MEMM at the institutions without qualifications and the project targeted all these staff at the institutions. Therefore, a "clinical technician" in the report refers to all staff who engage in MEMM.

[2] PDM stands for project design matrix. It is a matrix to show the overview of a project plan, which clarifies the objectives, activities, input, important assumptions, objectively verifiable indicators, etc., and the logical relationships among them.

[3] The PDM was revised twice at the first Joint Coordinating Committee and the mid-term review.

implementing agency. In terms of the financial aspect, there were some problems with the budget allocation for the improvement of organizational structure and the implementation of the training. Therefore, the sustainability of the project's effects is fair. In light of the above, this project can be evaluated as unsatisfactory.

1. Project Description



Project Location(s)

Provided Test Equipment

1.1 Background

After apartheid (the racial segregation policy) was abolished in 1994, the National Department of Health (hereafter, NDOH) acknowledged that health is a basic requirement for social and economic growth in the country. Therefore, NDOH began making efforts to strengthen the health system in South Africa, including capacity building of medical equipment maintenance and management, as one of the priorities for the improvement of health service delivery in terms of both quality and quantity. However, a large part of medical equipment maintenance had been outsourced to private companies, and, as a result, requests for services were not responded to promptly and the costs for MEMM had been quite high. Health facilities that received referrals from primary health facilities lack clinical engineering workshops, especially in poor areas, which resulted in a regional gap in the quality of health services. In addition, only fifteen percent of the people required for maintenance of medical equipment had been deployed, and a serious shortage of experienced clinical technicians existed.

Under the circumstances, NDOH directed a request for support for improvement of MEMM to the government of Japan in 2004. Upon the request, the project for "Capacity Building of Medical Equipment Maintenance and Management in Southern Africa" was launched in 2009 with the primary objective of developing and utilizing a comprehensive model for MEMM.

1.2 Project Outline

Overall Goal		Good Practice models in South Africa make an impact on the improvement of Medical Equipment Maintenance and Management (hereafter, MEMM) practices in the country.
Project Purpose		A holistic provincial model to improve MEMM is developed, which is applicable to other provinces in South Africa.
Output(s)	Output 1	A MEMM training package is developed in the pilot province based on evidence of the effectiveness of a training package model (Support the establishment of a provincial practical training institute for clinical engineering in the Eastern Cape).
	Output 2	The organizational structure of MEMM in the pilot provinces is reinforced (Strengthen HTC function in the Eastern Cape).
	Output 3	Enabling environment is prepared to disseminate the MEMM improvement model (Contribute towards the finalization of national standards and its application at provincial level).
Total cost (Japanese Side)		347 million yen
Period of Cooperation		June, 2009 – March, 2013 (Extended period: June, 2012 –March, 2013)
Implementing Agency		National Department of Health Eastern Cape Department of Health
Other Relevant Agencies / Organizations		East London Health Complex Port Elizabeth Health Complex Mthatha Health Complex
Supporting Agency/Organization in Japan		None
Related Projects		Improvement of Medical Equipment for Primary Health Care Institutes in Eastern Cape Province (JICA): January, 2005 – March, 2006

1.3 Outline of the Terminal Evaluation

1.3.1 Achievement Status of Project Purpose at the Time of the Terminal Evaluation

As for the project purpose, i.e., "A holistic provincial model to improve MEMM is developed, which is applicable to other provinces in South Africa," some parts of the project's model have been recognized in policy documents or guidelines developed by

both NDOH and the Eastern Cape Department of Health (hereafter, ECDOH), such as "A Framework for Health Technology Policies," and "Annual Performance Report 2009-2012 in ECDOH." Moreover, it was assessed that the application of the model by other provinces would be accelerated by the workshop to be conducted by the project with participation of stakeholders from other provinces.

1.3.2 Achievement Status of Overall Goal at the Time of the Terminal Evaluation (including other impacts.)

As for the overall goal, i.e., "Good Practice models in South Africa make an impact on the improvement of MEMM practices in the country," it was difficult to develop the good practice model which would be applicable to all the provinces because of the variety of the maintenance approaches in each province. However, the project managed to develop a holistic model for MEMM for replication in those provinces that adopt the same or similar maintenance approach as the Eastern Cape, and it was assessed to be likely that the model would impact the improvement of MEMM practices there. In addition, as an indication of the positive impact, relationships between stakeholders such as clinical technicians, medical institutions, training institutions and medical equipment agencies improved with MEMM.

1.3.3 Recommendations at the Time of the Terminal Evaluation

Some recommendations were made to NDOH, ECDOH, the targeted hospitals[4], the project team and JICA. The achievement of each recommendation by the time of the ex-post evaluation is shown below (Table 1).

Table 1 Recommendations at Terminal Evaluation and Achievements

Recommendations	Achievements
National Department of Health	
To support and advise ECDOH continuously on the allocation of clinical technicians[5] for adequate MEMM.	NDOH advised ECDOH on the allocation of clinical technicians in order to provide high quality of care during the project period.
To deliberate with ECDOH continuously, including training institutions, to improve MEMM.	The best way to secure human resources for MEMM was considered within NDOH; however, training institutions was not included.

[4] According to a Japanese expert, at the time of the completion of the project, the targeted hospitals were Dr. Malizo Mphele Memorial Hospital, St. Patrick Hospital, St. Elizabeth Hospital, Frontier Hospital, Nelson Mandela Academic Hospital and Butterworth Hospital. In addition to the above hospitals, other hospitals that clinical technicians were assigned were also considered as target hospitals during the project period. Therefore, when a clinical technician moves to another institution, the institution that he/she moves to becomes the targeted hospital.

[5] In the terminal evaluation report, it was described as a clinical engineer, but it is standardized as a clinical technician in the report.

To provide the essence of an MEMM good practice model, which the project would develop, to other provinces through periodical reporting sessions with provincial departments of health.	NDOH encouraged departments of health in other provinces to participate in a workshop in February 2013 and with the National Health Technology Committee (hereafter, NHTC), in order to share the achievements and the lessons learned from the project.
To brief NDOH leadership on the achievements of and challenges identified through the project—for example, through utilizing tools such as the NDOH Annual Report.	The achievement of the project did not appear on the document such as the NDOH Annual Report and there was no opportunity to share these achievements with others.
Eastern Cape Department of Health	
To develop an environment for training by considering both infrastructure improvement and human resource deployment.	Neither infrastructure improvement nor human resource deployment have been implemented. The training at COEGA Development Corporation[6] sponsored by ECDOH started in September 2015.
To support both the Provincial Health Technology Committee (hereafter, PHTC) and the District Health Technology Committee (hereafter, DHTC) to better understand and appreciate the importance and necessity of having a functional DHTC in all districts.	The draft TORs for both PHTC and DHTC were framed and ECDOH participated in the DHTC meeting in each district to support the activities of the DHTC. A PHTC/DHTC meeting with a workshop was held in February 2013.
To encourage DHTC to update and utilize the medical equipment inventory at the institution level. In addition, ECDOH should monitor the functionality of medical equipment and the quality of maintenance using test equipment and further requesting and analyzing periodical reports submitted by target hospitals.	The medical equipment inventory developed by both the project and the DHTCs was utilized to conclude a contract for maintenance and procurement by ECDOH. At the beginning, the medical equipment inventory was supposed to perform the monitoring through the computerized maintenance management system (hereafter, CMMS), and the system was experimentally introduced to Nelson Mandela Academic Hospital; however, it was dysfunctional at the time of the ex-post evaluation.
To encourage clinical technicians by creating awareness of clinical engineering as a profession with a potential career path, creating new posts and filling vacant posts for clinical technicians, seeking ways to retain existing clinical technicians and offering continuous refresher training.	Although the training at COEGA Development Corporation was provided, the working conditions did not improve, and it was difficult to see a career path developing in the future. Employee retention was still a serious problem for existing clinical technicians.
Targeted Hospitals	
To make clear the importance and the status of MEMM, which could result in better understanding and appreciation of it.	Sharing the information about the medical equipment inventory generated by test equipment and by participation in the DHTCs and the workshop contributed to a better understanding and appreciation of MEMM.

[6] The details will be given in “Impact” (P16).

Clinical engineering sections in targeted hospitals are recommended to report to ECDOH by optimally utilizing the records generated by the test equipment.	The records generated by the test equipment were reported to ECDOH and NDOH during the project period. It was planned for the records to be monitored through CMMS; however, the system has been dysfunctional so far.
Project Team	
To seek opportunities to share project achievements with other provincial departments of health. In addition, to address outstanding activities within the remaining project period.	The person from only one provincial department of health participated in the workshop in February 2013.
JICA	
To explore opportunities to perform periodical monitoring of the utilization of the test equipment result at targeted hospitals.	It was planned that CMMS would be utilized to perform monitoring; however, this has not been done so far. Although other ways were explored, there were no opportunities to perform a periodical monitoring.
To earmark and prioritize ECDOH candidates for MEMM group training courses being offered to the South African government. To strengthen the network of clinical technicians in South Africa and the Southern African region by interfacing with graduates (alumni) of MEMM training courses in Japan and third countries.	After the project completion, two people from the project participated in training in Japan; however, no network of clinical technicians was established. However, it has been already decided that clinical technicians from ECDOH will participate in a JICA Knowledge Co-creation Program in Japan in MEMM in 2016.

Source：The Terminal Evaluation Report, Questionnaire and Interview Survey

2. Outline of the Evaluation Study

2.1 External Evaluator

Kozue Amemiya, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: August, 2015 – September, 2016

Duration of the Field Study: November 9, 2015 – November 28, 2015

February 13, 2016 – February 21, 2016

3. Results of the Evaluation (Overall Rating: D[7])

3.1 Relevance (Rating: ②[8])

3.1.1 Relevance to the Development Plan of South Africa

At the time of planning, the implementation of the project was in line with one of the priorities, "securing safety and management for health technology to contribute to

[7] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

[8] ③ High, ② Fair, ① Low

improving basic health services," shown in the "National Health Strategic Plan 2007/08-2009/10," which was enacted in 2007. In addition, according to the "National Health Strategic Plan 2010-2012," a 10-point plan adopted by the health sector in South Africa, included the following priorities: "Overhauling the health care system and improving its management," and "Improving human resources planning, development and management." In the Eastern Cape Province, the "Policy and Budget Speech 2013/2014" had the priority of strengthening the procurement capability, asset management capability and human resource development of management.

Therefore, the project direction was consistent with the development policy of South Africa from the time of planning to the project completion.

3.1.2 Relevance to the Development Needs of South Africa

At the time of planning, there was a shortage of human resources for medical equipment and maintenance and only a few training programs were provided to existing clinical technicians. The development needs in the pilot province were considered high because the score[9] for the medical equipment maintenance level in the pilot province was far below the target score. Furthermore, the challenges in the pilot province were basically similar to other provinces; thus, it was assessed that the output of the project would contribute to improving MEMM in other provinces as well. At the time of the project completion, the number of clinical technicians was 23 in the Eastern Cape Province, which was far below the required number (78 in the National Standard).

Therefore, improvement of MEMM in South Africa which is the project purpose has been consistent with the development needs of the pilot and other provinces from the time of planning to the project completion.

3.1.3 Relevance to Japan's ODA Policy

At the time of planning, Japan's ODA policies in South Africa gave priority to assisting "livelihood improvement for poor communities," especially from the perspective of the health sector. Furthermore, since medical equipment was provided to 5 district hospitals, 6 health centers and 83 clinics in the Oliver Tambo district in the Eastern Cape as a grant aid project in 2006, it was expected that the project would lead to effective use of this equipment.

Therefore, the project's consistency with Japan's ODA Policy was also high.

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[9] The survey was conducted by NDOH. 7 items (management, staffing, laws and regulations, upgrading and replacement, inspections and testing, planning, and emergency properness) were evaluated comprehensively for the score for the Medical Equipment Maintenance Level. It was 35.84 in Eastern Cape (2006), against the NDOH's target score: 80. 6 items (planning, policies and procedure, equipment management, staff training, risk management and quality assurance) were evaluated comprehensively for the score or Health Technology Management Level. In the Eastern Cape, it was 18.65 against the NDOH'S target score of 80.

3.1.4 Relevance to the Appropriateness of Project Planning and Approach

At the time of planning, it was indicated that the project purpose was significantly high, in spite of the small amount of input. However, the Memorandum of Understanding (hereafter, MOU) for the project was signed immediately in order to make it a priority to schedule the project smoothly in agreement between the both sides that the project plan shall be revised after the project's launch. First, the target area of the overall goal was modified to focus on South Africa rather than Southern Africa[10] at the Joint Coordinating Committee[11] (hereafter, JCC) in August 2009. Second, subtitles were added to all outputs to be redefined for the purpose of corresponding with the actual project conditions, and the indicators for all the outputs were downgraded to reduce the scale of the project at the time of the mid-term review in July 2011. Then, some activities that were considered difficult to implement were called off.

Since the PDM of the project was modified to correspond with the situation at that time, this modification is judged to be appropriate. On the other hand, each output was modified from independent point of view, which led to a lack of logic for the plan from the whole outputs to the project purpose. Additionally, it was difficult to properly assess both the output and the project purpose after the indicators were downgraded.

Therefore, the project planning and approach were not appropriate.

Based on the above, it can be seen that the project was highly relevant to the country's development plan and development needs and to Japan's ODA policy. On the other hand, the project planning and approach were not appropriate. Therefore, its relevance is fair.

3.2 Effectiveness and Impact[12] (Rating: ①)

3.2.1 Effectiveness

3.2.1.1 Project Output

(1) Indicators for Output

The outputs and the indicators for each output revised at the time of the mid-term review in July 2011 are shown in Table 2.

[10] Including Botswana, Namibia, Lethoto, Swaziland, Malawi, Zambia and Zimbabwe.

[11] The Joint Coordinating Committee Members were as follows: Health Technology Directorate, NDOH, Health International Relations Directorate, NDOH, ECDOH, JICA South Africa Office and Project Team Members.

[12] Sub-rating for effectiveness is to be combined with a consideration of impact.

Table 2 Indicators for Each Output

Output	Verifiable Indicator
Output 1： A MEMM training package is developed in the pilot province based on evidence of the effectiveness of a training package model (Support the establishment of a provincial practical training institute for clinical engineering in the Eastern Cape)	**Verifiable Indicator 1：** Practical training institute is established
	Verifiable Indicator 2： Number of new staff trained by the institute (Target: 8 new staff)
Output 2： The organizational structure of MEMM in the pilot province is reinforced (Strengthen HTC function in the Eastern Cape)	**Verifiable Indicator 1：** Number of established District Health Technology Committees (DHTC) (Target: 3 DHTCs)
Output 3： Enabling environment is prepared to disseminate the MEMM improvement model (Contribute towards the finalization of national standards and its application at provincial level)	**Verifiable Indicator 1：** Number of hospitals taken medical device inventory (Target: 10 hospitals)

As already mentioned in "3.1.4 Relevance to the Appropriateness of Project Planning and Approach," it is difficult to assess the achievement of each output according to the above indicators after revising the PDM. Thus, the achievement of each output was assessed according to the following points of view.

1) Output 1

Although output 1 intended to develop "A MEMM training package," its subtitle indicated that it would support the establishment of a provincial practical training institute. Moreover, the PDM in the Japanese version showed that it would establish a training system. The above three interpretations create ambiguity about what output 1 indicates exactly. In this regard, the understanding of the Japanese expert, the Japanese expert's counterpart and JICA also differed. Therefore, in terms of output 1, it was assessed by combining two initial indicators and the above three points, including "Development of a MEMM training package," "Establishment of a provincial practical training institute" and "Establishment of a training system."

2) Output 2

Although an indicator for output 2 was the number of district health technology committees (hereafter, DHTCs) established, the subtitle for output 2 intended to reinforce the organizational structure of MEMM in the pilot province. Both PHTC and DHTCs had an important role in supporting lower level HTC from the province to the districts and from the districts to the institutions. Therefore, it was assessed that it would focus not only on the establishment of DHTCs but also on the establishment of PHTC and institutional HTCs, their activities, and the support systems among them.

3) Output 3

At the time of planning, output 3 intended to prepare for sharing the project' model with other provinces as an environmental arrangement[13]. However, the PDM was revised and became what is shown in table 2 above at the time of the mid-term review. It was then recognized as environmental improvement in institutions in the pilot province. Even in the latter case, using only the medical device inventory did not contribute to the finalization of national standards and their application at the provincial level, as shown in the subtitle. Thus, the achievement was assessed whether the medical equipment inventory was utilized by the CMMS or other systems. Besides, it was confirmed whether the activities for sharing the project' achievement were performed.

(2) Achievement of Output

1) Output 1

At the initial plan, the project planned to develop a training package containing a textbook and a curriculum based on existing training programs, and training of trainers was also one of the contents of the package. In fact, the kinds of training contents that would be necessary for new staff were considered, and then the project sorted out the existing training and showed a combination of the Technical Competency Assessment (hereafter, TCA) training and the Health Technology Management (hereafter, HTM) training with the amount of budget to be required and the list of the agencies which could provide the trainings. On the other hand, the training curriculum and the textbook were not developed. Four of the new staff[14] was trained using the training program by local agents and teaching staff at universities. According to the staff from JICA, there were several reasons for the project not to establish an original training program. First, the universities to foster clinical technicians in South Africa did not provide enough practical training, and, as a result, it was difficult to develop skills to utilize medical equipment. Second, it was difficult to find trainers who could provide practical training with adequate skills. Therefore, providing an original training program did not fit with the reality.

In terms of establishing a training system, the local agent and the universities teaching staff provided the TCA training and the HTM training respectively for existing clinical technicians on an irregular basis. As mentioned above, the training of new staff was conducted only once and these training sessions were not approved as an official training program in the Eastern Cape Province by ECDOH. Therefore, the

[13] Output 3 in the initial plan was to develop a project website in order to share the information about training and the organizational structure of MEMM in a pilot province with clear intellectual property rights.
[14] Two out of these had worked as electrical engineers and others had been the level of the future graduates from college.

establishment of the training system can hardly be assessed to be achieved.

In terms of the establishment of a training institute, the project renovated the training room at Frere Hospital in order to use it as a training facility. Although the training room was used for meetings and trainings for MEMM occasionally, nobody was assigned for the training facility to manage it. At the time of the project completion, there was no plan for periodical training; therefore, it was assessed that the training facility at Frere Hospital was not recognized as a training institution.

Therefore, the above three points were not achieved, and thus output 1 was also assessed as not being achieved.

2) Output 2

Six out of seven districts in the pilot province established DHTCs and carried out several activities such as the medical equipment inventory. Moreover, some institutions with clinical technicians receiving a HTM training established HTCs. On the other hand, according to members from DHTCs and HTCs at the medical institutions, few HTCs received support for their establishment and activities from the upper level of HTCs in accordance with the draft terms of reference (hereafter, TOR), and most of the HTCs established their committees and conducted the medical equipment inventory by themselves without any support. As mentioned above, the support system from the upper level of HTCs to the lower level was not developed. Thus, it can be assessed that the establishment of DHTCs did not contribute to strengthening the organizational structure of MEMM in the pilot province. In addition, TORs for PHTC and DHTC were not approved by ECDOH because the position that was capable of making a decision was vacated, and then nobody could give approval for it.

Therefore, some HTCs in the province, in the district and in the institutions were established; however, it was difficult to conclude that it contributed to strengthening the organizational structure in the pilot province. Hence, output 2 was moderately achieved.

3) Output 3

Although six hospitals carried out medical equipment inventory by utilizing the standard performance test procedure developed by the project, any results of the inventory were not utilized by CMMS or any other source. Moreover, output 3 did not contribute to sharing the activities of the project or receiving recognition from other provinces.

Therefore, output 3 was not achieved.

3.2.1.2 Achievement of Project Purpose

(1) Indicators of Project Purpose

The indicator and the achievement of the project purpose at the time of the project completion is shown in Table 3. Although the indicator of the project purpose states that a holistic model to improve MEMM should be developed by the pilot province and should be capable of being adopted as an applicable model in other provinces, this indicator did not show clearly what the model was adopted for. In this regard, it was assessed whether the project achievements or models were recognized in policy documents or guidelines developed by the NDOH and ECDOH at the final evaluation. Therefore, it was also assessed from the same perspective at the ex-post evaluation.

Table 3 Achievement of Project Purpose

Project Purpose	Indicator	Actual
A holistic provincial model to improve MEMM is developed, which is applicable to other provinces in South Africa.	By the end of the project, a holistic model to improve MEMM developed in the pilot province is adopted as an applicable model for other provinces.	There were no policy documents or guidelines documenting the project's model developed by the NDOH or ECDOH.

(2) Achievement of Project Purpose

There were no policy documents or guidelines documenting the project's model developed by NDOH or ECDOH. The activities in the initial plan contained a consultation with other provinces in the project's model as part of output 1 and output 2 in order to make the model applicable; however, the consultation was conducted only once at the beginning of the project period—namely, there were no sufficient opportunities for discussing the drafted model with other provinces. Besides, the maintenance approach varied among the provinces because of the decentralization[15]. Therefore, it was impossible to adopt the project's model itself, and it was necessary to have an opportunity to discuss the model to make it "applicable". As described, NDOH did not encourage other provinces to become actively involved in the project, and then, the project' model was not described in the policy reports or guidelines.

The project did not achieve its purpose because it can be assessed that the project's model was not an "applicable model" for other provinces and did not adopt the National Standards. Therefore, the project's purpose was not achieved.

[15] After apartheid was abolished in 1994, residential areas for black people were integrated and new municipalities were installed. Therefore, a new constitution to set up a framework of municipalities was established in 1996, which clarified the respective authority and responsibilities of the nation, province and district.

3.2.2 Impact

3.2.2.1 Achievement of Overall Goal

The questionnaire survey was conducted with departments of health in eight provinces, besides the pilot province, in order to confirm the achievement of the overall goal at the ex-post evaluation. Seven out of eight provinces answered the questionnaire. This was followed by conducting a hearing survey with them. The achievement of the overall goal at the time of the ex-post evaluation is shown in Table 4.

Table 4 Achievement of Overall Goal

Overall Goal	Indicator	Actual
Good Practice models in South Africa make an impact on the improvement of MEMM practices in the country.	At the end of FY2015, all provinces will utilize the essence of good practice of MEMM model.	Of the seven provinces that responded, three provinces have established a PHTC. NHTC was established independently of the project in 2010. After that, NHTC supported the establishing of PHTC in all provinces. Even in the case of the provinces with PHTC, the PHTC members did not understand what the achievements of the project were. Therefore, it can be seen that the establishment of PHTCs was not influenced by the project. As for the other good practice, it was assessed that no achievement was made in the other provinces in terms of the project's good practice. Even in the pilot province, there are still many obstacles to MEMM, and it was not found to improve it.

According to hearings from the departments of health in seven provinces, one was aware of the achievement of the project because the director was a member of the project[16]. Only one out of six provinces recognized the project implementation and its achievements, but no other provinces recognized it.

The overall goal was to have all provinces using the good practice model; however, as already mentioned in "3.2.1.2 (2) Achievement of Project Purpose", the maintenance approach varied among the provinces[17]. Therefore, it was difficult to adopt the good practice model in other provinces. Moreover, according to the JICA staff, other provinces were less committed to the project after the pilot province was determined. Based on the above, it was important to implement the activity with the intention of sharing the project's model with other provinces. In reality, however, the workshop that was meant to share information about the project's achievements was held only once at the end of the project period, and only Limpopo province

[16] The trainer for HTM was assigned as a director at Health Technology Directorate in the Western Cape DOH after the project completion.

[17] Several provinces outsourced MEMM. Therefore, these provinces did not assign clinical technicians to the institutions, but only to the Department of Health.

participated in it. That is to say, this workshop was insufficient for sharing the good practice model with other provinces. Any activities such as holding a workshop, introducing the project's model from NDOH and describing it within the policy documents were not performed by the project's completion.

The study examined the differences in MEMM before and after the project was completed in order to assess whether the project's good practice had contributed to the improvement of MEMM at the time of the ex-post evaluation. The self-completion questionnaire survey was conducted for medical staff such as doctors, nurses and mid-wives at eleven institutions where clinical technicians received support from the project and maintained and managed the medical equipment. Samples were selected by means of judgement sampling, which was introduced by the chief executive officer or clinical technicians at each institution[18].

First, the results from the questionnaire survey about MEMM were gathered at each institution from forty-five medical staff who had been at the institution from the launch of the project, as shown in Figure 1. Since the number of valid responses, i.e., forty-five, is not enough to assess the project's effects, the results should be regarded as having only a reference value. The proportion of staff who answered "improved" reached 57.8%.

[18] The sample size was 105. Frere Hospital 15 (Doctors 4, Nurses 8, Midwives 3), Nelson Mandela Academic Hospital 18 (Doctors 6, Nurses 10, Midwives 2), Dr. Malizo Mpehle Memorial Hospital 14 (Doctors 4, Nurses 6, Midwives 4), St. Elizabeth Hospital 14 (Doctors 4, Nurses 7, Midwives 3), Butterworth Hospital 19 (Doctors 4, Nurses 9, Midwives 6), Frontier Hospital 14 (Doctors 5, Nurses 3, Midwives 6), St. Barnabas Hospital 8 (Doctors 2, Nurses 5, Midwives 1), St. Lucys Hospital 1 (Nurse 1), Isilimela Hospital 1 (Nurse 1) and Zituhulele Hospital 1 (Midwife 1).

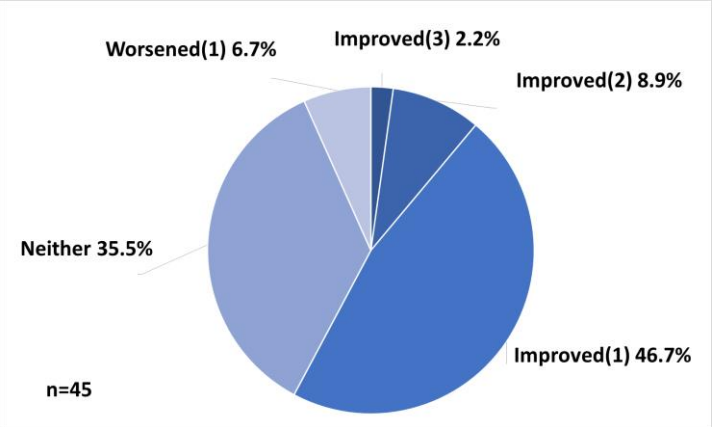


Figure 1 Comparison of MEMM before (2008) and after (2013) the Project

Source: Beneficiary survey from medical staff at institutions

Remarks: 5-level evaluation (1: Very good 2: To some extent 3: Medium 4: Not so much 5: Not at all) was conducted on before and after the project respectively. Based on the result, the graph shows how many steps the institutions improved or worsened by; e.g., "Improved (3)" means improved by 3 steps such as from "4: Not so much" to 1: Very good" and form "5: Not at all" to "2: To some extent".

Second, the results of the survey of all the medical staff on the technical level of the knowledge and practical skills of clinical technicians at each institution are shown in Figure 2.

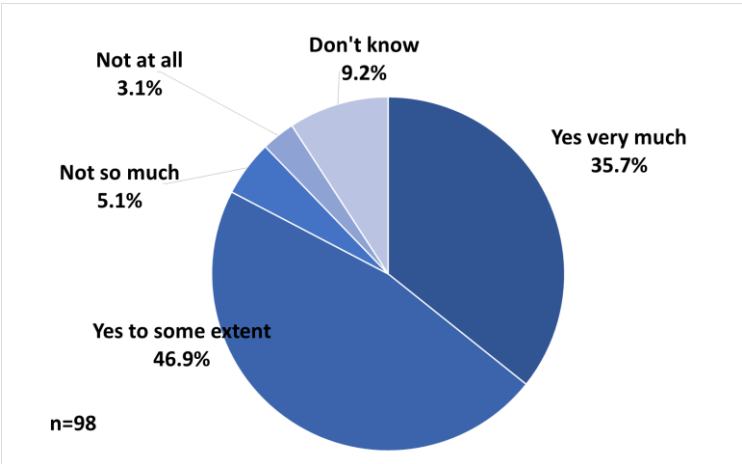


Figure 2 Technical Level of Knowledge and Practical Skill for Clinical Technicians from the Perspective of Medical Staff at the Time of the Ex-post Evaluation

Source: Beneficiary survey from medical staff at institutions

83% of the valid responses for ninety-eight of the respondents were “Yes very much” or “Yes to some extent”. This shows that most of the medical staff assessed their technical level as high. Moreover, the staff at a certain department of health in another province that employed clinical technicians who received training as part of the project believed that their performance was high. Based on the above, it can be considered that the project’s training contributed to an improvement in the staff’s knowledge and practical skills. On the other hand, the training of new staff was not provided after the project completion, and thus, the number of clinical technicians was low at the time of the ex-post evaluation, compared to at the project completion. Since no formal PHTC and DHTC meetings were held after the project completion, it was assessed that the organizational structure had not yet improved. Based on the above, only the training had an effect on the improvement of the clinical technicians’ skills; however, the training did not continue. Hence, it was recognized that the improvement of MEMM was limited.

The overall goal was not achieved because no provinces adopted the good practice models and there was few improvement in MEMM.

3.2.2.2 Other Impacts

No negative impacts on the natural environment and no resettlement or land acquisition occurred.

According to the implementing agency, the training at COEGA Development Corporation[19] in Port Elizabeth was provided for new staff who had graduated college after September 2015. Twenty students received the training at the time of the ex-post evaluation. They were supposed to work at the institutions or the department of health in the Eastern Cape after 18 months of training. The training there showed an effect of the project such as the TCA training from output 1.

This project did not achieve its project purpose and overall goal because only the training had a small effect. Therefore, the effectiveness and impact of the project are low.

[19] The COEGA Development Corporation is a state-owned company established in 1999. COEGA’s vision is to be a catalyst for socio-economic growth in the Eastern Cape and South Africa. Providing customized trainings with training facilities is one of the functions of the COEGA.

3.3 Efficiency (Rating: ①)

3.3.1 Inputs

Table 5 Plan and the Actual Input of the Project

Inputs	Plan	Actual
(1) Experts	・ One long-term expert (36 MM*) ・ Two short-term experts ・ Policy advisor:16 million yen ・ Technical advisor:10 million yen	・ Two long-term experts (Medical equipment maintenance and management: 35.37 MM) ・ One short-term expert (Technical advisor: 0.43 MM)
(2) Equipment	4 million yen ・ Vehicle ・ Laptop PC for an expert ・ Database application	175 million yen ・ Test equipment ・ Hand tool for medical equipment maintenance
(3) Operational costs	・ Implementation of training (34 million yen) ・ Web construction (9 million yen) ・ Local operational costs (16 million yen)	Overseas activities costs: 74 million yen ・ Two local consultants One technical advisor (11.16 MM) One test equipment advisor (2.53 MM) ・ One project assistant
Japanese Side Total Project Cost	180 million yen	347 million yen (192% of the plan)
South Africa Side Operational Expenses	No description for costs (Counterpart personnel, project office, trainer, training facility and implementation of training, guideline and training material)	1.3 million yen

* MM stands for man month.

3.3.1.1 Elements of Inputs

(1) Japanese Input

Although the nine-month absence of the Japanese long-term expert had an effect on the stagnation of the project, locally available human resources were optimally utilized. After the Japanese expert, who has additional post of project coordinator was dispatched, the practical skill training was conducted effectively with good collaboration.

The costs for equipment provision increased compared to the initial plan because an additional twelve kinds of test equipment were donated to twelve institutions[20]; however, the additional cost did not result in the increase of expected effect of the project. The project purpose was to develop a holistic model in a pilot province that would be applicable to other provinces. The additional provision was considered dispensable in order to achieve the project purpose. On the other hand, it could be considered relevant to the project if the provision was for the training institute to develop a training program or workshops at tertiary hospitals in the health complexes. In actuality, the facility level of the twelve institutions receiving the provision varied, and two out of nine institutions, which was confirmed at the ex-post evaluation, did not use any equipment because the clinical technicians did not understand how to use them, they did not have the medical equipment that was to be tested by the test equipment or there were no clinical technicians at the institution.

Therefore, the equipment provision to the twelve institutions was not appropriate.

(2) South Africa Input

According to the implementing agency and the Japanese expert, the number of counterparts decreased to two from three during the latter half of the project period, which led to the project's delay. The project's office was located far from the office for the counterpart at ECDOH, which also had an influence on the project implementation. Moreover, the counterparts were assigned to ECDOH and three health complexes that were located far away from each other. According to the implementing agency and a Japanese expert, there were some difficulties involved in the project from the health complexes in Port Elizabeth and Mthatha, which were located between 200 and 300 km from East London.

3.3.1.2 Project Cost

Although the project cost was planned to be 180 million yen, the actual cost was 347 million yen, which was significantly higher than planned (192%). The major

[20] These were the institutions assigned a clinical technician at the time selected.

reason why the project cost exceeded the planned amount was that the equipment provision increased by 171 million yen in comparison to the plan. As mentioned above, the equipment provision did not contribute to enhancing expected effects of the project.

3.3.1.3 Period of Cooperation

Although the project period was planned to be 36 months, the actual period was 45 months, which was 125% longer than planned. The extension was considered appropriate because there was the partial absence of a Japanese expert for 9 months.

Although both the project cost and the project period exceeded the plan, they did not contribute to the achievement of the project purpose. Therefore, the efficiency of the project is low.

3.4 Sustainability (Rating: ②)

3.4.1 Related Policy and Institutional Aspects for the Sustainability of Project Effects

At the time of the ex-post evaluation, the project was aligned with program 5 in the "National Health Strategic Plan 2014-2019", which includes "Health facilities infrastructure planning" and "Workforce development and planning". Therefore, MEMM remains a high priority in South Africa's development policy.

3.4.2 Organizational Aspects of the Implementing Agency for the Sustainability of Project Effects

Although the project's implementing agencies were NDOH and ECDOH, the counterparts were also assigned at three health complexes in East London, Mthatha and Port Elizabeth. Although the health complexes were dissolved after the project, Frere Hospital in East London, Nelson Mandela Academic Hospital in Mthatha and Livingstone Hospital in Port Elizabeth held the workshop and undertook core roles as tertiary hospitals in the surrounding area at the time of ex-post evaluation. In addition to these institutions, PHTC and DHTCs are considered as a necessary structure for the sustainability of the project effects. Therefore, all of the structures are assessed in this point.

(1) National Department of Health

Only two staff members were assigned to the Health Technology Department at NDOH. The director took over after the project completion, and the expectations were high; however, allocation of two staff members was not a sufficient amount to manage all of the health technology matters in the whole country in addition to routine work

such as policy planning, monitoring and procurement. Therefore, the organizational structure at NDOH was inadequate to support continuing the project activities.

(2) Eastern Cape Department of Health

Although seven staff members were supposed to be assigned to the Health Technology Directorate, only five staff members were assigned at the time of the ex-post evaluation. The organizational structure has changed since the project completion, and a director whose position has been vacant was assigned. As the other four staff members have been at the directorate since the project began, they understand the project well. Most of the departments of health in the districts did not have any clinical technicians at the time of the ex-post evaluation, which has led to an increased workload at ECDOH to take care of everything technical in these districts. The organizational structure at ECDOH is inadequate for continuing the project activities unless assigning more clinical technicians to each district. Moreover, since ECDOH commissions the training for the COEGA Development Corporation, the organizational structure at ECDOH is insufficient to manage all the training by itself as a package.

(3) PHTC and DHTCs

Due to the fact that both PHTC and DHTC do not implement any activities at the time of the ex-post evaluation, it can be seen that there is no PHTC and DHTC structure in a substantial sense. According to the staff at the departments of health in the districts, most of the DHTCs stopped their activities because the staff receiving the HTM training were transferred to other positions. Therefore, it can be assessed that the HTCs developed by the project have not been firmly established as committees in the organizational structure of MEMM.

(4) Medical Institutions at the Health Complex

Staff assignment at the above three tertiary medical institutions, which functioned as the core medical institutions, has not changed very much. Since there is a shortage of clinical technicians in the health technology section at Nelson Mandela Academic Hospital and Livingstone Hospital, the staff at the management level have to take care of MEMM in the clinical setting in both their own hospital and in surrounding institutions. As the health complexes were dissolved at the time of the ex-post evaluation, there is a possibility of them changing their role in the province.

(5) Institutions and Clinical Technicians

An improvement in the relationship between clinical technicians and medical equipment manufacturers/agencies could be found because clinical technicians received the TCA training from them. This positive relationship makes clinical technicians contact them actively when they experience any difficulties at an institution, and this contributes to persistent improvement in the capacity for MEMM at the institutional

level. In addition, the number of clinical technicians will increase because of the training at COEGA Development Corporation.

Based on the above, the organizational structure at NDOH and ECDOH has not changed largely; however, some problems still remain regarding the assignment of staff. In addition, the HTCs are dysfunctional. Therefore the project was moderately sustainable in terms of its organizational aspects.

3.4.3 Technical Aspects of the Implementing Agency for the Sustainability of Project Effects

(1) Technical Capacity of Management

The training by NDOH and ECDOH has not been conducted using the project's training package since the project completion, and it has been outsourced to a different program. Both PHTC and DHTCs implemented some activities just after the project completion, and since then, they have not carried out any action at the time of ex-post evaluation. Moreover, there is no response to the problems faced; for example, the TORs for both HTCs still remain in draft form. Some institutions conducted the medical equipment inventory by themselves without any support from DHTCs.

Therefore, both NDOH and ECDOH lack the level of technical skill for the sustainability of the project's effect because they could not manage the training or support for the institutions for the HTCs.

(2) Technical Capacity of the Maintenance of Equipment

Although most of the test equipment provided is in good condition and utilized on a routine basis, some of it is rarely used. Software for data analysis has not been updated, and despite signing the contract for calibration until 2017 with an agent, annual periodic updates have not been conducted since 2013. ECDOH and the medical institutions have tried to contact the agents; however, no more action has been taken at the time of ex-post evaluation, as the agents could not be contacted. The calibration is legislated and it is a serious problem that the test equipment is being used in the institutions without calibration. This issue should be dealt with by ECDOH, not the institutions, because ECDOH needs to manage all of the medical equipment in a province. Therefore, the technical capacity of the medical equipment maintenance at ECDOH has not been established.

3.4.4 Financial Aspects of the Implementing Agency for the Sustainability of Project Effects

(1) National Department of Health

The budget for MEMM at NDOH is shown in Table 6. It has been increasing, and there is now a different financing system for medical infrastructure, including medical equipment, in order to secure the budget, which is called the "Health Facility Revitalization Grant" and is taken from the "National Health Strategy 2014-2019". Based on the above, NDOH has an adequate budget after the project's completion. However, it is possible that the situation might change because the National Health Insurance[21] might change the budget allocation for the procurement of medical equipment[22].

Table 6 Budget for Medical Equipment at NDOH

(Unit: Thousand Rand)

		2013/14	2014/15
Medical equipment maintenance and management			
	Budget	46,000	76,000

Source: Interview and Questionnaire survey for NDOH

(2) Eastern Cape Department of Health

The budget for and actual expenditure on MEMM at ECDOH is shown in Table 7. The budget for both procurement and maintenance of equipment is sufficient to manage them. On the other hand, it is regarded to be problematic that the sufficient budget for procurement discourages the staff from maintaining the medical equipment and leads to insufficient awareness of the importance of MEMM because it enables the institutions to purchase new equipment instead of repairing them. All of the budgets are connected to each category and fixed to what it is to be spent, which leads to inflexibility in the use of the budget. As a result, despite securing a sufficient budget at ECDOH, it becomes difficult to secure human resources and training in the health technology section because the section is not allowed to manage the budget for them[23].

[21] National Health Insurance targets all South African citizens and the implementation is envisaged to be a 14-year process in total from 2007. There are three phases and currently 11 NHI pilot districts in the country that have been tested in the first phase. On the other hand, the taxation system for the insurance has not yet been decided.

[22] At the time of the ex-post evaluation, the province procured the medical equipment from the national government, putting together the application from the institutions. In other words, most of the staff who procured the equipment did not understand what it was like at the institutions. After the introduction of the NHI, it is expected that a practical procurement will be implemented, as the data for MEMM is planning to be managed at the national level. However, there are many uncertainties whether flexible actions will be taken depending on the situation.

[23] The Health Technology Directorate needed to apply to the Human Resource Development Directorate for the budget.

Table 7 Budget and the Actual Expenditure for Procurement and MEMM at ECDOH

(Unit: Thousand Rand)

		2011/12	2012/13	2013/14	2014/15	2015/16
Procurement						
	Budget	23,200	23,289	48,805	23,741	40,949
	Expenditure	15,489	11,589	34,393	13,886	12,708
Medical equipment maintenance and management						
	Budget	5,900	17,947	1,140	12,881	26,000
	Expenditure	2,341	8,876	1,120	7,481	5,845

Source: Interview and Questionnaire survey for ECDOH

Therefore, although there are some problems with the budget allocation, the project is sustainable in terms of its financial aspects.

Some minor problems have been observed in terms of the organizational and technical aspects of the implementing agency. Therefore, the sustainability of the project effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project was implemented to improve MEMM in South Africa by providing a holistic model that contains the development of a training system for clinical technicians in order to build the capacity of MEMM and by strengthening the organizational structure for MEMM in Eastern Cape Province, the pilot province, and by utilization of the developed model by other provinces.

The project was consistent with the development policy and development needs of South Africa, the aims of which were to secure health technology, develop human resources and improve the health system from the time of planning to the project completion. In addition, the project's consistency with Japan's ODA policy was also high because the policy gave priority to capacity development in the health sector. As a result of the revision of the PDM, with a reduction in the number of activities performed, the project design was not coherent from its activities and outputs to the project purpose, and this had a negative effect on the effectiveness and impact of the project. Hence, its relevance is fair. Each output was not achieved either and activities such as the consultation were not sufficient to adopt the project's model in other provinces. Therefore, the project purpose was not achieved. The overall goal was not achieved either because no activities have been performed since the completion of the project. Thus, the effectiveness and impact of the project are low. The project period was extended and the

project cost exceeded the planned amount because of the additional equipment provision; however, these additional inputs did not contribute to an increase in the output. Hence, the efficiency of the project is low. Although sustainability in terms of the policy aspect is high, some major problems have been observed in terms of the organizational and technical aspects of the implementing agency. In terms of the financial aspect, there were some problems with the budget allocation for the improvement of organizational structure and the implementation of the training. Therefore, the sustainability of the project's effects is fair. In light of the above, this project can be evaluated as unsatisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

(1) Reorganization of a HTC

Since it is difficult for ECDOH alone to maintain the MEMM system in the Eastern Cape, it is necessary to make both PHTC and the DHTCs functional. Therefore, it is recommended that ECDOH revise the TORs for both PHTC and DHTC, which are prepared by the project, and approve them for the continuing activity of HTCs. In addition, although the health complexes were dissolved, Frere Hospital in East London, Nelson Mandela Academic Hospital in Mthatha and Livingstone Hospital in Port Elizabeth function as tertiary hospitals, having a workshop with several clinical technicians to maintain the medical equipment. Therefore, it is recommended that the health technology sections in these hospitals support the departments of health in the districts, which do not have any clinical technicians in collaboration with ECDOH and PHTC.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

(1) Planning of the project, including activities about introducing the model case to other areas.

Although the project purpose was to improve MEMM in all provinces, there was no close contact with other provinces before or during the project period. Additionally, the PDM was revised several times, which led to a reduction in the activities that would have introduced the project's model to other provinces. As a result, there were few activities encouraging other provinces to adopt the project's achievements during the project period, and this resulted in to a failure to expand them to the whole country.

The system of MEMM varied among the provinces due to decentralization.

Therefore, NDOH was unable to force provinces to follow the national guidelines, and it was difficult to share the project's model through NDOH.

When a project that aims to expand a model developed in a pilot place to other areas or to the whole country is planned, the possibility of applying the model to other places and ways to expand the model need to be carefully considered at the time of planning, paying attention to the governance structure. Moreover, starting from the planning stage, those who would be involved in the project, not only representatives from the pilot area but also from other areas where the model to be developed is expected to be applied later, need to agree on adopting the model in their areas. Then, the project should conduct monitoring and a workshop with them during the project period. At the same time, NDOH should support and encourage them to continue their activities.

(2) Optimal allocation of inputs to achieve outcomes when the additional budgets are provided

The actual project costs were significantly higher than planned because of the additional equipment provision. When investment of the additional budget is being considered, it is necessary to assess whether this input is really necessary for the project in light of the project design and whether the additional input contributes to increasing the project outcome. Even though the equipment is necessary at the site, it should be carefully examined in terms of efficiency.

In the case that the project's implementation system is insufficient or there is a lack of technical skills to provide training, it is necessary to consider other inputs other than the provision of equipment, which contribute to increasing the outcome of the project such as dispatching a Japanese expert or local staff.

(3) Allocation of locally available human resources

The Japanese expert was in charge of coordinating the project and a local technical advisor was in charge of MEMM during the project. Since the local consultant had vast experience in teaching MEMM in African countries and had a good understanding of the South African health system, he gained a lot of credibility from clinical technicians and provided effective training.

Therefore, it is an effective way to hire a local person with good knowledge of the local situation to contribute to improving the efficiency and effectiveness of the technical cooperation project.

(4) Utilization of local agents

The practical trainings in MEMM were conducted by both a short-term expert and local agents who knew a lot about the equipment used in the local environment, which enabled them to provide practical training on management skills, based on the deep

knowledge on the characteristics of each equipment. Moreover, using local agents led to a good relationship between them and clinical technicians, which contributed to improving MEMM at the field level.

Depending on the prevalent management and maintenance system and the relationship with local agents and the availability of human resources, the provision of training and the establishing of the management system in collaboration with local agents and manufacturers can be considered effective for the MEMM project.

Kingdom of Swaziland

FY2015 Ex-Post Evaluation of Japanese Grant Aid Project

"The Project for the Improvement of Secondary Education"

External Evaluator: Chiho Ikeda,

Foundation for Advanced Studies on International Development

0. Summary

The project aimed to improve the educational opportunities and environments in secondary education[1] in target areas by constructing new secondary schools in twelve rural areas in Swaziland. This was expected to contribute to reducing the disparity in secondary education between urban and rural areas as desired by the Swazi government.

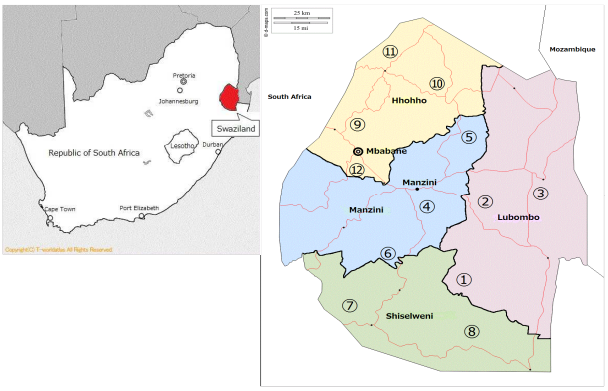
Swaziland has consistently focused on human resource development and has defined the importance of secondary education in its policy. However, the educational disparity between urban and rural areas has been a problem; at the same time, the number of secondary schools has been insufficient, while the number of students enrolled in secondary education has increased. Under such circumstances, the project's aim was consistent with Swaziland's development policy and needs. Thus, the relevance of the project implementation is high. The efficiency of this project is high, as both the project period and the costs were mostly as planned.

As a result of the project's implementation, the targeted areas' educational opportunities and environments have been improved. Although the project's contribution to reducing educational disparities between urban and rural areas has been limited because the target schools are small in proportion to all secondary schools in Swaziland, the project has contributed in terms of education quality in those target areas. Furthermore, according to the beneficiary survey, some positive changes have been observed, such as the positive changes in the perception that guardians/communities have towards secondary education. Therefore, the effectiveness as well as the impact of this project are high. Minor problems in terms of the financial aspects have been observed in respective schools; thus, the sustainability of the project's effect is fair.

In light of the above, this project is evaluated to be highly satisfactory.

[1] Primary and secondary education system in Swaziland are 7-3-2 system which designed as seven years of primary education (Grade 1-7), three years of junior secondary education (Form 1-3), and two years of senior secondary education (Form 4-5) (Preparatory Survey for the Education Programmes in the Kingdom of Lesotho and the Kingdom of Swaziland 2009). The schools constructed by the project are schools for both junior and senior secondary education, and they receive students from Form 1 to Form 5. Hence, "secondary education" in this report means both junior and senior secondary education.

1. Project Description



Project Locations[2]

Secondary School Constructed by the Project

1.1 Background[3]

In the "National Development Strategy (NDS): Vision 2022" (1997-2022) and the "Poverty Reduction Strategy" (2006), the government of Swaziland acknowledged that human resources are the primary resources in a small country with limited natural resources. Education for the development of human resources was positioned as the country's first priority in order to achieve economic growth and poverty reduction.

The Ministry of Education and Training (MOET) formulated the "Strategic Plan for the Education Sector 2010-2022" as the implementation strategy for the NDS. It aimed to improve the educational environment and laid out several goals, including: (i) to ensure a 100% progression rate from primary to secondary school by 2015, (ii) to ensure an appropriate distribution of schools to limit the walking commute distances to less than 5 km, (iii) to achieve a gross enrollment ratio (GER)[4] of 80% in secondary education by 2015 and 90% by 2022, and (iv) to promote an efficient curriculum[5].

Moreover, the lack of secondary education facilities and the existence of disparities in urban-rural educational opportunities were also confirmed in the findings of the "Preparatory Survey for the Education Programmes in the Kingdom of Lesotho and the Kingdom of Swaziland," which was conducted by JICA in March 2009. Therefore, the provision of equal educational opportunities was identified as an urgent issue.

[2] The left image is a location map of Swaziland. The right is a location map of the project site (produced by evaluator based on http://d-maps.com/m/africa/swaziland/swaziland72.gif).
[3] Refer to the Preparatory Survey Report
[4] The number of children enrolled in a certain educational level, regardless of age, divided by the population of the age group that officially corresponds to that same level (UNICEF).
[5] The "Strategic Plan for the Education Sector 2010-2022" was still under government review at the time of the preparatory survey. At the time of ex-post evaluation, it was finalized as "Education Sector Strategic Plan 2010-2022" follows the same goals.

Under such circumstances, the Grant Aid project[6] to construct new secondary schools in twelve sites among four districts (LUBOMBO district: ① Mabhensane, ② Mabondvweni, ③ Nyetane; MANZINI district:④ Nhlambeni, ⑤ Mliba, ⑥ Mandulo; SHISELWENI district:⑦ Mlambo, ⑧ Mpakeni; HHOHHO district: ⑨ Hawane, ⑩ Dinani (Etfuntini),⑪ Sobokazana (Hhelehhele), and ⑫ Masibekela (Mantabeni)[7] was implemented.

1.2 Project Outline

The objective of this project is to improve the secondary educational opportunities and environments in the targeted areas by constructing new secondary educational facilities, thereby contributing to the reduction of the disparity in secondary education between urban and rural areas.

G/A Grant Amount / Actual Grant Amount	1,143 million yen / 1,143 million yen
Exchange of Notes Date (Grant Agreement Date)	March, 2011 / March, 2011
Implementing Agency	Ministry of Education and Training
Project Completion Date	March, 2013
Main Contractors	Contractors[8]: 【Lot 1 & 6】 WSL Construction (Pty), Ltd. 【Lot 2】 Afrotim Construction (Pty), Ltd. 【Lot 3】 Pado Construction (Pty), Ltd. 【Lot 4】 Wilmo Construction (Pty), Ltd. 【Lot 5】 Smith & Glendinning Swaziland Construction (Pty), Ltd. Furniture Supplier: Afritool (Pty), Ltd.
Procurement Agency	Japan International Cooperation System
Main Consultants	Fukunaga Architects-Engineers
Outline Design	February, 2010 - June, 2011

[6] This project was implemented by the "Grant Aid for Community Empowerment," which was one of the sub-schemes of the Japanese Grant Aid. This sub-scheme aimed to support a comprehensive capacity development of communities. It was implemented using local businesses, equipment, and materials based on local specifications and designs in order to reduce costs. The name of "Grant Aid for Community Empowerment" has not been used for the projects approved after March 2015 due to the discontinuance of the sub-schemes in April 2015 (refer to JICS Web site).

[7] After the completion of the project, three schools, which were constructed in the Etfuntini, Hhelehhele, Mantabeni sites, have been given school names of Dinani, Sobokazana, and Masibekela. This report uses the names of the schools instead of the sites' names.

[8] "Lot" represents the construction sites. Lot 1 represents Nhlambeni and Mliba, Lot 2 represents Mandulo and Mlambo, Lot 3 represents Mabhensane and Mpakeni, Lot 4 represents Mabondvweni and Nyetane, Lot 5 represents Dinani and Sobokazana, and Lot 6 represents Hawane and Masibekela.

Related Projects	【Technical Advisor】 Teacher education specialist in science and mathematics (incl. ICT) (31 January 2012-25 December 2012) Advisor for In-service teacher training for science in secondary education (April 2016-December 2017) 【Grant Aid for Grassroots Human Security Projects】 Support for the construction of classrooms in primary schools (25 projects) (2001-2013) 【Senior Volunteer】 Senior Volunteer ICT (July 2012-June 2013; April 2014-February 2015, December 2015-Present) 【Other Organizations】 European Union (EU): Support for education and training programs (2008-2010) United Nations Children's Fund (UNICEF): Support for free primary education (2009-2010)

2. Outline of the Evaluation Study

2.1 External Evaluator

Chiho Ikeda, Foundation for Advanced Studies on International Development

2.2 Duration of Evaluation Study

Duration of the Study: August, 2015 – July, 2016

Duration of the Field Study: November 2, 2015 – November 17, 2015

February 15, 2016 – February 17, 2016

3. Results of the Evaluation (Overall Rating: A[9])

3.1 Relevance (Rating: ③[10])

3.1.1 Relevance to the Development Plan of Swaziland

The government of Swaziland acknowledged in the "National Development Strategy (NDS): Vision 2022" and in the "Poverty Reduction Strategy and Action Program" that human resources were the primary resources in the country and education for the development of human resources was crucial. Furthermore, an improvement in the enrollment rate and in the

[9] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[10] ③ High, ② Fair, ① Low

educational environment of secondary education had been aimed for in the “National Education Policy 1999” as well as in the “Strategic Plan for Education Sector 2010-2022.”

The NDS that was reviewed in 2014 mentioned that human resource development was one of the seven macro strategic areas, and that providing practical secondary education of every child was important. In addition, “The Swaziland Education and Training Sector Policy,” which was released as the substitute policy of the “National Education Policy 1999” and the final version of the “Education Sector Strategic Plan 2010-2022” had set the goal for improving the educational opportunities and quality of secondary education.

Therefore, the project has been relevant to Swaziland’s development policy.

3.1.2 Relevance to the Development Needs of Swaziland

At the time of planning, the number of students enrolled in secondary education had been increasing since 2004, with an increase in the number of students enrolled in primary education. Moreover, the number of students enrolled in secondary education was expected to continue increasing in the future, due to the free primary education started in 2010. On the other hand, the number of secondary schools was insufficient[11]; therefore, the construction of new secondary educational facilities was an urgent issue.

At the time of ex-post evaluation, there is still a large shortage of secondary schools, although the number of secondary schools has increased every year (refer to Table 1).

Furthermore, the educational disparity between urban and rural areas is a challenging issue in Swaziland. The net enrollment ratios[12] (NER) of junior secondary schools in the Lubombo and Shiselweni districts are low compared to that of the Hhohho district, which has the capital city Mbabane, and compared to the Manzini district, which has the economic center city Manzini. This means that educational opportunities in secondary schools for children in rural areas are limited compared to that for children in urban areas (refer to Table 2).

Table 1: Number of Students Enrolled / School in Primary and Secondary (Junior/Senior)

		2009	2010	2011	2012	2013
Number of Students Enrolled	Primary	231,066	241,231	239,124	239,322	239,019
	Secondary	86,534	89,838	80,950	90,573	93,065
Number of Schools	Primary	565	595	603	613	619
	Secondary	216	238	250	255	273

Source: Document provided by JICA, MOET’s questionnaire response, and Annual Education Census Report 2013

[11] Refer to the Ex-ante evaluation

[12] The number of children enrolled in a certain level of education in school who belong to the age group that officially corresponds to schooling, divided by the total population of that same age group (UNICEF).

Table 2: Net Enrolment Rate of Junior Secondary per District

(Unit: %)

	2010	2011	2012	2013
Hhohho District	29.0	30.8	30.1	31.1
Manzini District	37.8	37.1	30.3	41.7
Shiselweni District	26.5	24.9	23.1	25.2
Lubombo District	14.9	17.9	23.3	15.9

Source: Annual Education Census Report 2013

Thus, the need for secondary educational facilities in rural areas, including rural schools in Shiselweni and Lubombo, continues to be high.

3.1.3 Relevance to Japan's ODA Policy

At the TICAD IV in 2008, Japan developed the action plan to construct 1,000 primary and secondary schools (approximately 5,500 classrooms) in Africa by 2012 as support for expanding access and quality in basic education[13]. Furthermore, Japan had a basic policy to support the self-help efforts of Swaziland that aimed to reduce poverty, and support for basic human needs was set as a priority issue[14]. Thus, this project was consistent with Japan's ODA policy at the time of planning.

As stated above, this project has been highly relevant to the country's development plan and development needs as well as to Japan's ODA policy. Therefore, its relevance is high.

3.2 Efficiency (Rating: ③)

3.2.1 Project Outputs

In this project, a new secondary school was constructed in twelve rural areas, and chairs and desks for students and teachers were also procured. Both facilities and furniture were constructed and procured as planned.

By using the remaining balance produced by a high exchange rate for Japanese yen, one additional student toilet building for each school was constructed in order to sufficiently ensure student privacy by separating boys' and girls' toilets[15].

Additionally, 24 elevated water tanks (2 for each of the 12 schools) and 48 rain water tanks (4 for each school) were given to each school in order to secure the water reserve capacity for the time when the water supply is stopped. Furthermore, desks and chairs for multipurpose rooms and administration buildings were procured for the effective use of the facilities with

[13] Refer to the TICAD IV Yokohama Action Plan 2008
[14] Japan's ODA Data Book 2010
[15] Although students' toilets were planned in constructing one building with both boys' and girls' booths, its design considered student privacy by separating the boys' and girls' entrances. (Interview with main consultant)

utilizing the remaining balance (refer to Tables 3 and 4).

Table 3: Planned and Actual Output for the Construction of Facilities

Facility	Planning	Actual
Classroom	29 buildings （97 classrooms: 4 classrooms×10 buildings, 3 classrooms×19 buildings）	As planned
Science Laboratory	12 buildings（1 building×12 sites）	
Multipurpose Room A[16]	12 buildings（1 building×12 sites）	
Multipurpose Room B[17]	12 buildings（1 building×12 sites）	
Administration Block	12 buildings（1 building×12 sites）	
Teachers' Housing	24 buildings（48 houses: 2 buildings （4 houses） ×12 sites）	
Students' Toilet	12 buildings（1 building×12 sites）	24 buildings （2 buildings×12 sites）
Water Tank	12 tanks（1 tank×12 sites）	As planned
Elevated Water Tank	Not planned	24 tanks （2 tanks×12 sites）
Rain Water Tank	Not planned	48 tanks （4 tanks×12 sites）

Source: Ex-ante evaluation and Document provided by JICA

Table 4: Planned and Actual Output for the Procured Furniture

Facility	Planning	Actual
Classroom	Students' desks: 3,880, Students' chairs: 3,880 Teachers' desks: 97, Teachers' chairs: 97	As planned
Science Laboratory	Students' tables (for eight): 60 Students' chairs: 480 Teachers' laboratory tables: 12 Teachers' chairs: 24	
Multipurpose Room A	Not planned	Students' desks: 480 Students' chairs: 480
Multipurpose Room B	Not planned	Students' chairs: 480
Administration Block	Not planned	Teachers' desks: 36 Teachers' chairs: 258

Source: Ex-ante evaluation and Document provided by JICA

In addition to the output above from the Japanese side, the installation of facilities, such as school fences and gates, as well as the procurement of school equipment used in the science

[16] At the time of planning, multipurpose room A was expected to be utilized for the subject of home economics or for the agriculture laboratory and school kitchen. At the time of ex-post evaluation, multipurpose room A was being utilized as a home economics room in all the schools.

[17] At the time of planning, multipurpose room B was expected to be utilized for an ICT practical room or for a practical subject. At the time of ex-post evaluation, multipurpose room B was being utilized as an ICT practical room in all the schools.

laboratory and multipurpose rooms, were done by the Swaziland side[18].

3.2.2 Project Inputs

3.2.2.1 Project Cost

The actual project cost of the Japanese side was 1,143 million yen, which is the same as planned[19]. As mentioned above, the remaining balance due to the strong Japanese yen was used for additional construction of facilities and procurement of furniture. In addition to that, the remaining balance was also used as a reimbursement[20] for the costs covered by the Swaziland side, such as that for the installation of water wells, school fences, and gates.

The actual project cost of the Swaziland side exceeded the plan; while the planned cost was 81 million yen (6,031,999 emalangeni), the actual cost was 110 million yen (8,252,080.36 emalangeni), which constitutes 136% of the planned cost[21]. The actual cost exceeded the planned cost because the actual cost of equipment for the science laboratory and multipurpose rooms was higher than planned. As for the reason, it has been considered that the purpose of the multipurpose rooms was not clear at the time of planning[22]. Considering the fact that there was an agreement that any additional cost exceeding the planned cost would be covered by the Swaziland side— as only the minimum cost required for implementing the curriculum was estimated in the plan—the efficiency of the project cost was examined by a comparison of the planned cost and the actual cost of Japanese side only.

3.2.2.2 Project Period

The project was started a month early in order to receive students in January 2013, as the school term of Swaziland begins in January. The project period was mostly as planned[23]. While the planned period was 20.5 months (from August 2011 to the middle of April 2013), the actual

[18] Computers were provided by Taiwan, and 443 computers (34-40 for each school) were installed in 12 schools in total. Although furniture for multipurpose rooms was planned to be procured by the Swaziland side, it was procured by the Japanese side using the remaining balance due to the strong Japanese yen.
[19] The cost efficiency of the project was examined by a comparison of the planned cost and the actual cost. In the case of the grant aid project involving the procurement agency, the planned amount, after details in the design survey, is acknowledged as planned amount, and the amount agreed by the exchange note, including the agent fee, is acknowledged as actual amount (document provide by JICA).
[20] "Reimbursement" is a method wherein the same amount that the partner country paid is reimbursed by the donor organization after the project's completion. (Refer to official document by JICA) In this project, approximately 10 million Japanese yen (795,427.92 emalangeni) was reimbursed to Swaziland under the condition that the total remaining amount in the account was less than three percent of the total amount of the Grant and its accrued interest excluding the procurement agent fee. (Document provided by JICA)
[21] Both planned and actual cost were calculated with the exchange rate used in the detailed design, namely 1 lilangeni = 13.45 yen, the average exchange rate for six months (from 1 November, 2010 to 30 April, 2011). The interior work for the multipurpose rooms and the administration building, which costed approximately 99 million yen (7,357,431.89 emalangeni), was also done by the Swaziland side. However, it was not included in the actual cost for the comparison, because this cost was not estimated in the plan.
[22] The evidence for the planned cost estimation was not obtained.
[23] The starting point of the period, both for the actual period and the planned period, was set on the date of drafting the tendering document.

period was 20.6 months (from 21 June 2011 to 7 March 2013[24]).

As stated above, the project cost on the Japanese side was as planned, and the project period was mostly as planned. Therefore, the efficiency of the project is high.

3.3 Effectiveness[25] (Rating: ③)

This project was implemented aiming at the improvement of secondary educational opportunities and environments in the targeted rural areas. To measure the project's effectiveness in terms of improving educational opportunities, the "number of students enrolled in target schools," which was set as a quantitative indicator during planning, and the "number of students who have been enabled to enter a nearby secondary school to their residence" were collected as quantitative indicators in the ex-post evaluation survey.

Regarding the indicators for measuring the project's effect in terms of enhancing the educational environment, the "number of teachers allocated to the target schools" and the "utilization of school facilities" were analyzed as quantitative indicators. The "satisfaction of users" and "improving students' commuting environments by decreasing their commuting distances and times" were analyzed as qualitative indicators.

3.3.1 Quantitative Effects (Operation and Effect Indicators)

(1) Number of Students Enrolled in Target Schools

As shown in Table 5, more students enrolled in the target schools than expected, although the number differed among the respective schools. According to the interviews and questionnaires with the target schools, it was revealed that the need for secondary education in the target areas was high, particularly in Mabhensane and Mabondvweni, due to the fact that there were either no secondary schools in those areas, or the nearest secondary school was very far from the target areas. At the same time, many students have been transferred to the target schools, particularly to Nyetane and Mliba, from other secondary schools. A lot of students have been transferred to the target schools because some students, who had to commute far for secondary school, preferred to go to a school closer to their residence. The new home economics room and ICT laboratory, with sufficient facilities and equipment, are also reasons for the increasing number of students, as they are attractive for students in other schools as well as for new applicants to secondary school.

On the other hand, some target schools received a smaller number of enrolled students. For

[24] Although the schools were handed over to the government of Swaziland in January 2013, the same time of establishing the schools, some work remained in some sites. Thus, the completion date of the project was set on the date that those remaining works were completed.
[25] Sub-rating for effectiveness is to be put with consideration of impact.

instance, Mlambo received fewer students than expected due to expensive school fees in the first year[26]. In the case of Hawane, guardians who have enough financial resources tended to enroll their children in urban secondary schools, where the results of the Junior Certificate (JC) exam and the Swaziland General Certificate of Secondary Education (SGCSE) exam[27] have been good; Hawane is located approximately 15-20 minutes (driving) from the capital city of Mbabane[28].

Table 5: Number of Students Enrolled in Target Schools

Indicator	Baseline	Target	Actual
	2010	2015	2015
	Baseline Year	2 Years After Completion	2 Years After Completion
Number of Students Enrolled in Target Schools	0	2,708	2,961

Source: Preparatory Survey Report and Target school's questionnaire responses

【Per schools】

School	Target (2015)	Actual (2015)	Difference from Target Number	Percentage for Target Number
Mabhensane	168	280	112	167%
Mabondvweni	182	258	76	142%
Nyetane	171	300	129	175%
Nhlambeni	228	210	▲18	92%
Mliba	223	392	169	176%
Mandulo	265	244	▲21	92%
Mlambo	291	198	▲93	68%
Mpakeni	245	238	▲7	97%
Hawane	261	183	▲78	70%
Dinani (Etfuntini)	250	265	15	106%
Sobokazana (Hhelehhele)	192	182	▲10	95%
Masibekela (Mantabeni)	232	211	▲21	91%
Total	**2,708**	**2,961**	**253**	**109%**

Source: Preparatory Survey Report and Target school's questionnaire responses

[26] For the first year of school commencement, Mlambo set a high school fee, which was 4,335 emalangeni per student for Form 1, 2, 3, and 5, and 4,660 emalangeni for Form 4. As a result, more than half of the applicants among over 100 applicants in the first instance, cancelled their application. The following year, more students enrolled due to the decrease in the school fee caused by an investigation into neighboring schools' fees, which was 2,535 emalangeni per student for Form 1, 2, 3, and 5, and 2,885 emalangeni for Form 4.

[27] The JC exam is an external exam for Form 3, the last year of junior secondary education. Only students who pass the JC exam can proceed to senior secondary education. In the same way, the SGCSE exam is an external exam for Form 5, the last year of senior secondary education. The students who pass that exam can proceed to higher education, such as university, college, or vocational training school, depending on their passing grade.

[28] It is considered that people living around the Hawane area are richer than those in other rural areas, as many of them work in Mbabane; the ratio of OVC students is lower than that of other target schools. Thus, those people tend to send their children to urban secondary schools, which have high pass rates on the exams. However, the number of students in Hawane schools has increased due to sufficient results on the JC exam in 2014: a passing rate of 94.12% (interview with head teacher in the Hawane School; result of JC exam; questionnaire).

As mentioned above, the total number of students enrolled in the target schools was 2,961 at the time of ex-post evaluation (2015). This number includes the number of transferred students from other secondary schools. According to the students' group interviews[29], it was concluded that the children in the target areas would have had to go to distant secondary schools if the project had not constructed the target schools, as most of their elder siblings went to distant secondary schools before the project. To calculate the number of students who were able to enter the secondary schools constructed by the project implementation, the number of "transferred students of all respective Forms"[30] in each school was examined; that number was deducted from the total number of enrolled students in 2015. The total number of transferred students in the target schools was 439[31]. Therefore, it can be surmised that the number of students who were enabled to enter a nearby secondary school owing to the project was 2,522.

(2) Number of Teachers Allocated in Target Schools

The project was intended to promote the allocation of teachers to rural areas by constructing 48 teacher housing units, which can accommodate 84 teachers in total. At the time of ex-post evaluation (2015), 222 teachers were allocated in total to the target schools. Also, the number of teachers at each school exceeded the target figures, except Hawane, as is shown in Table 6. Among them, 83 teachers utilize the teacher housing, which is nearly at capacity. According to the interviews with the head teachers in the target schools, there are no teachers from their areas. Teachers who cannot be accommodated with housing commute to school by car or public transport, or rent a house near their school.

Therefore, it can be considered that 222 teachers have been allocated to the target schools.

Table 6: Number of Teachers Allocated to the Target Schools

Indicator	Baseline	Target	Actual
	2010	2015	2015
	Baseline Year	2 Years After Completion	2 Years After Completion
Number of Teachers Allocated to the Target Schools	0	No setting (estimated number 186)	222

Source: Preparatory Survey Report and Target school's questionnaire responses

[29] Sample size and the number of respondents was 264 (Mabhensane 20, Mabondvweni 17, Nyetane 25, Nhlambeni 20, Mliba 20, Mandulo 20, Mlambo 20, Mpakeni 22, Hawane 26, Dinani 24, Sobokazana 25, Masibekela 25). Classes and students were designated by respective schools.

[30] "Transferred students of respective Forms" are the students who transferred from other secondary schools and had not enrolled in the target schools from Form 1 for the purpose of starting secondary education in the target schools.

[31] This number was calculated excluding the transferred students in Mabondvweni (all Forms), Nyetane (Form 1), and Mlambo (Form 1), because that data were not obtained.

【Per schools】

School	Target (2015)	Actual (2015)	Difference from Target Number	Percentage for Target Number
Mabhensane	14	19	5	136%
Mabondvweni	14	18	4	129%
Nyetane	14	25	11	179%
Nhlambeni	15	17	2	113%
Mliba	15	19	4	127%
Mandulo	17	19	2	112%
Mlambo	17	18	1	106%
Mpakeni	17	18	1	106%
Hawane	17	15	▲2	88%
Dinani (Etfuntini)	17	20	3	118%
Sobokazana (Hhelehhele)	14	15	1	107%
Masibekela (Mantabeni)	15	19	4	127%
Total	**186**	**222**	**36**	**119%**

Source: Preparatory Survey Report and Target school's questionnaire responses

(3) Utilization of School Facilities

The utilization of the school facilities is shown in Table 7. Facilities are being utilized effectively in the respective schools, except for students' toilets in Mliba and Nhlambeni[32]. Some students' toilets in Nhlambeni have not been utilized due to the key being lost.

Students' toilets in Mliba have not been utilized, and new toilets were constructed within the premise after the project's completion. According to the head teacher, the reasons for not using the toilets constructed by the project are: "It is close to the school entrance" as well as "It affects well water because water level is high during the rainy season"[33].

Furniture was properly installed in the respective rooms. Additionally, the procured elevated water tanks and rain water tanks have being utilized effectively, especially during the dry season and in the areas of low water supply.

[32] Nhlambeni, Hawane, and Mandulo use vacant classrooms as their library, store room, or secretary office because of the smaller number of enrolled students than expected. Since Mliba constructed a new structure of classrooms due to their overcapacity of students, they use a vacant classroom as a library. According to the head teacher, the toilet key for Nhlambeni will be replaced.

[33] The students' toilets were planned to be constructed away from the school entrance. However, after excavating, it was discovered that groundwater level was high during the rainy season, and the decision was to replace the current location that is close to the school entrance, with the assistance of MOET. Although MOET has tried to fix the problem by carrying out additional water proofing work in order to prevent the impact during the rainy season, even now the big problem for Mliba is the location of the toilets. According to the head teacher, these toilets will be renovated and utilized as a storage facility because Mliba had already constructed other students' toilets in their premises.

Table 7: Utilization of School Facilities

Facility	Plan (2010)	Actual (2015)	Status
Classroom	97 rooms	97 rooms (6 classrooms used for other purposes)	Classroom: 91 (all schools) Library: 2 (Nhlambeni), 1 (Mliba) Store: 1 (Mandulo), 1 (Hawane) Secretary room: 1 (Mandulo)
Science Laboratory	12 rooms	12 rooms	Average number of classes per week is 34
Multipurpose Room A	12 rooms	12 rooms	Used as home and economic room Average number of classes per week is 24
Multipurpose Room B	12 rooms	12 rooms	Used as ICT laboratory Average number of classes per week is 20
Administration Building	12 buildings	12 buildings	Installed head teacher's room and staff room
Teachers' Housing	48 units (Estimated number of users: 84 teachers)	48 units (Actual number of users: 83 teachers)	All units are utilized Occupancy rate: 91.7% (2013), 97.6% (2014), and 98.8% (2015)
Student toilet (male)	12 buildings (97 booths)	11 buildings (87 booths)	Unusable: 1 building (8 booths) (Mliba) Loss of key: 2 booths (Nhlambeni)
Student toilet (female)	12 buildings (97 booths)	11 buildings (88 booths)	Unusable: 1 building (8 booths) (Mliba) Loss of key: 1 booth (Nhlambeni)

Source: Preparatory Survey Report and Target school's questionnaire responses

3.3.2 Qualitative Effects

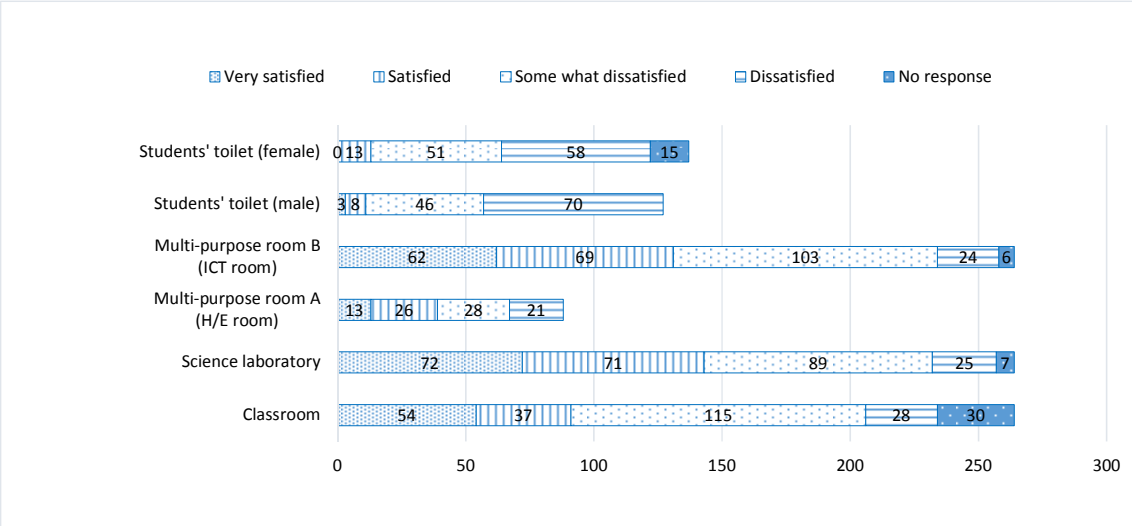
(1) Improvement of Educational Environment (user's satisfaction with facilities)

As mentioned above, it can be said that the educational environment in the target areas was improved by the project in terms of a quantitative aspect, as almost all of the facilities were utilized for their planned purposes. To measure the project's effect from a qualitative perspective, a user satisfaction survey was administered to the students (the number of valid responses was 264[34]) and teachers (the number of valid responses was 111[35]) of the target schools. The results of the survey are shown in Figure 1, Figure 2, and Table 8.

Although the satisfaction level of the students and teachers was not very high, they indicated that the educational environment had been improved by the project, as they are currently able to perform their necessary practical work—the reason for "very satisfied and satisfied." On the other hand, the reason for "somewhat dissatisfied and dissatisfied" involved insufficient classrooms and teachers' housing units due to a larger number of students and

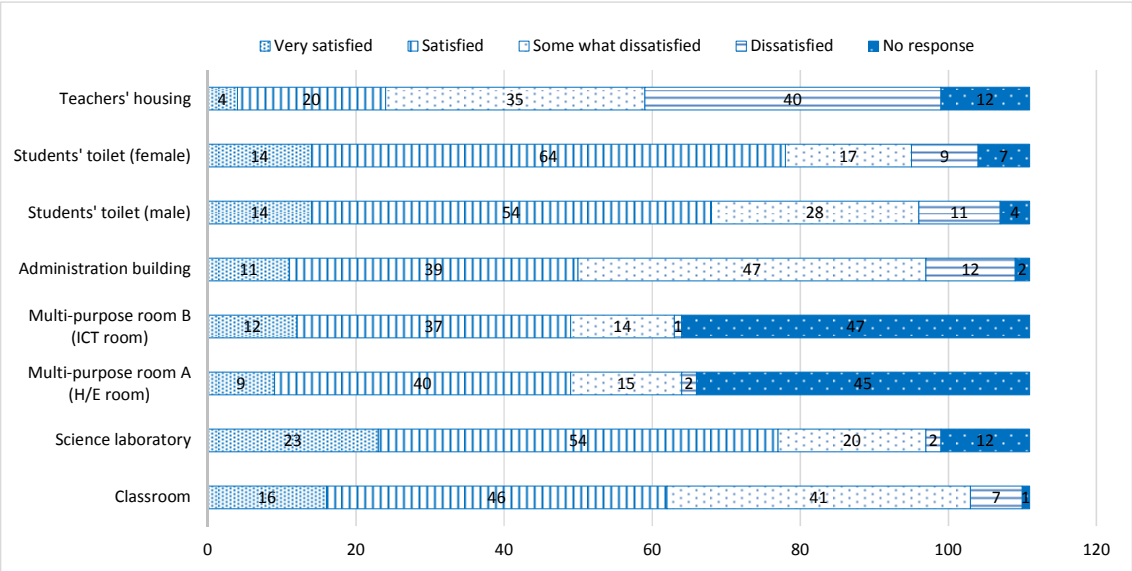
[34] The sample size is the same as footnote No. 29.
[35] The sample size and the number of respondents were 111 (Mabhensane 9, Mabondvweni 10, Nyetane 8, Nhlambeni 11, Mliba 10, Mandulo 9, Mlambo 10, Mpakeni 9, Hawane 7, Dinani 9, Sobokazana 10, and Masibekela 9). Teachers were designated by respective schools.

teachers than was estimated. Other reasons involved complaints about facilities caused by inappropriate daily use, and the seeking of better educational environments. Therefore, it can be considered that users thought the educational environment had been improved by the project; meanwhile, they desire more complete school facilities.



Source: Beneficiary survey (students' group interviews)

Figure 1: Student Satisfaction with Facilities[36]



Source: Beneficiary survey (questionnaire with teachers)

Figure 2: Teacher Satisfaction with Facilities[37]

[36] The number of respondents to questions about satisfaction with multipurpose room A (home economics room) and the students' toilets were fewer because the question was asked only to the students who use those facilities.
[37] There are two reasons that many respondents did not respond to questions about the satisfaction with multipurpose rooms A and B. One reason was that they could not recognize the purpose of the multipurpose rooms: A is for home economics, and B is an ICT room because this was not mentioned in the questionnaire. Another reason was that

Table 8: Major Reasons of Responses

Facility	Respondent	Reasons for "Very satisfied; Satisfied"	Reasons for "Somewhat dissatisfied; Dissatisfied"
Classroom	Students	・Sufficient number and space of classroom ・ Kept clean	・Insufficient number of classrooms compared to the number of students ・No shelf for books and school bags
	Teachers	・Educational tools, such as chalkboard, desk, and chair, are available ・Latest structure	・Insufficient number / space of classrooms compared to number of students ・Floor is damaged (hole on the floor) ・Bad ventilation
Science Laboratory	Students	・Sufficient space ・Experimental tools are available	・Insufficient number of classrooms compared to number of students ・Respective laboratory for junior and senior students is needed ・Insufficient experimental tools
	Teachers	・Good design ・Latest experimental tools are available ・Kept clean	・Drawer is broken
Multipurpose Room A (H/E room)	Students	・Sufficient space ・Practical equipment is available ・Separated from classroom	・Insufficient space compared to number of students ・Respective rooms for junior and senior students are needed ・Insufficient number of equipment
	Teachers	・Kept clean ・Good educational environment	・Insufficient space compared to number of students ・Separate room for fashion and fabrics is needed
Multipurpose Room B (ICT room)	Students	・Sufficient number of computers ・Equipment such as a printer and projector are available ・Air conditioner is available	・Insufficient number of computers ・Projector is not available ・Not connected to the Internet
	Teachers	・Good teaching environment ・Educational equipment is available	・Insufficient space compared to number of students ・Bad ventilation
Student Toilet (Male)	Students	・Sufficient number of booths ・Private booth is available	・Urinal is needed ・Emits bad smell ・Flush toilet is needed
	Teachers	・Sufficient number of booths ・Private booth is available ・Good location ・Standard design ・Kept clean ・Easy to maintain	・Insufficient number of booths compared to number of students ・Flush toilet is needed ・Urinal is needed ・Not maintained in a hygienic manner ・Some doors are broken ・Located close to the kitchen
Student Toilet (Female)	Students	・Sufficient number of booths ・Private booth is available	・Emits bad smell ・Some doors are broken ・Close to classrooms ・Distant to hand washing area
	Teachers	・Sufficient number of booths ・Private booth is available ・Good location	・Insufficient number of booths compared to number of students ・Inappropriate location (close to male

teachers who do not teach science, home economics,or ICT do not use those rooms.

		・Standard design ・Kept clean ・Easy to maintain	toilet) ・Flush toilet is needed ・Not maintained in a hygienic manner ・Some doors are broken
Administration Building	Teachers	・Furniture is available	・Insufficient number / space compared to number of teachers ・No storage room
Teachers' Housing	Teachers	・Good design ・Furniture is available ・Modern structure	・Insufficient number compared to number of teachers ・Need to share room with two families ・Some furniture is broken ・Bad ventilation

Source: Beneficiary survey

In the three years since the project's completion, respective schools have constructed new facilities, such as an agriculture laboratory, poultry house, new classroom structure, and school hall, via the school fees and a grant from the micro-project program[38]. Educational equipment, such as a projector, photocopier, and printer, has been purchased through school fees. Internet connection in the ICT laboratory is available in six of the twelve target schools[39].

(2) Improving Students' Commuting Environments by Decreasing their Commuting Distances and Times

The secondary schools constructed by the project, except Masibekela, were in rural areas where there were no secondary schools within walking distance (within 10 km) (3 schools) or there was a long commute (over 5 km) (8 schools) to the nearest secondary school. Thus, the project was expected to reduce students' commuting distance/time[40]. As stated above, it is considered that 2,522 students have been enabled to enroll in nearby secondary schools by the project. Thus, the commuting environment of the children in the target area has been improved by reducing their commuting distance/time.

[38] The micro-project program supports the project, which is a community-based, small-sized, self-help development effort. It is operated by the Microprojects Programme Coordinating Unit (MPCU), a semi-independent unit of the Ministry of Economic Planning and Development. A community can apply to the micro-project program under the condition that more than 25% of the project's costs is borne by the community. The micro-projects program grants the remaining balance up to 75% of the investment cost for an approved project (refer to http://www.microprojects.co.sz/). According to the interview with MOET, MOET also supports the project cost recently. In case construction is stopped due to the failure of the project cost covered by the communities/schools, MOET covers the remaining project cost for communities/schools, and requests MPCU to complete the construction.

[39] JICA dispatched the senior volunteer of ICT to Swaziland twice; the first period was from July 2012 to June 2013, and the second period was from April 2014 to February 2015. He supported the network building of secondary schools in Swaziland, including the target schools.

[40] Before the implementation of the project, the commuting distance to the nearest secondary school was approximately 5.5-12 km. The activity designed and implemented a catchment area policy that will allow students to have a school within 5 km walking distance of their home, which is stated as one of the activities for securing 100% progression from primary to junior secondary education in the Strategic Plan for the Education Sector, both at the time of planning and ex-post evaluation. Although the Masibekela area had a secondary school within 5 km, it was selected as one of the target sites because of the high demand for a secondary school due to the overcrowded classrooms in the secondary school at the area.

In addition, given the results of the student's group interviews[41] as shown in Table 9, it is supposed that most of the students have been able to go to a secondary school within one hour (walking distance) after they enrolled in the target schools, otherwise, they had to take a long time to get to secondary school because there were no secondary schools within walking distance.

Table 9: Commuting Means and Times for Students in Target Schools

Means of transportation	Number of Respondents	Commuting time			
		Less than 30 minutes	Less than 1 hour	Over 1 hour	Over 2 hours
On Foot	217	86	83	43	5
By Bus	28	11	14	3	0
By Guardian's Car	3	2	1	0	0
Combination of Foot and Bus	16	4	9	3	0
Total	264	103	107	49	5
Percentage	100%	39%	40%	19%	2%
Percentage of "on foot"	*82%*	*33%*	*31%*	*16%*	*2%*

Source: Students' group interviews

Furthermore, according to the questionnaire survey to teachers[42], approximately 95% (105 teachers) responded that the educational opportunity of secondary education in their rural areas had been improved. Concerning the reason for this improvement, approximately 62% (65 teachers) among them mentioned the reduction of commuting distance/time by the project.

Guardians also brought up the following issues as a good result of the reduction of their children's commuting distance/time in their group interviews[43]; "Children were exhausted by commuting long distance to school before the project but it was improved by the project."(Nyetane), "Before the project, guardians were worried that their children were forced to come home in the dark during the winter but now they don't need to worry about that because of the project" (Mabhensane), "Children are able to go to school even in rainy season now."(Mandulo, Mabondvweni)

3.4 Impacts

3.4.1 Intended Impacts

As stated, the project was expected to contribute to the reduction of the disparity in secondary education in terms of educational opportunities and quality between urban and rural areas.

[41] The sample size was the same as in footnote No. 29. The commuting distance before the project set the distance to the nearest secondary school from the target areas, as it is presumed that most of the students enrolled in the target schools are Form 1 because all schools were newly constructed.
[42] Sample size is the same as footnote No.35.
[43] Sample size is 35. (Mabhensane 2, Mabondvweni 14, Nyetane 7, Mandulo 12) Some of them are the member of school committee and were designated by the head teachers in respective schools.

To see the project's contribution to the reduction of the disparity in secondary education between urban and rural areas, "disparity in secondary education" was analyzed in both quantitative and qualitative aspects, which were "disparity in educational opportunities" (quantitative aspect) and "disparity in quality of education" (qualitative aspect). Since the figure of the number of students enrolled in secondary schools after 2013 was not officially available, for the analysis, the former was examined by the number of JC exam applicants[44], and the latter was examined by a ratio of the successful applicants of the JC exam and those with "Grade C and above[45]" on the SGCSE; these figures were available on the Examinations Council of Swaziland (ECOS)[46] Web site[47].

(1) Contribution to the Reduction of the Disparity in Educational Opportunities

Table 10 shows the changes in the number of JC exam applicants in urban and rural areas. The number of JC exam applicants has not increased in proportion to the increase in secondary schools and enrolled students, as the ratios of repeater and drop-out students are high in Form 1 and Form 2[48]. The percentage of target schools among the number of JC exam applicants in rural areas was 2.3% (2014) and 5.0 % (2015).

Table 10: Number of JC Exam Applicants in Urban and Rural Areas

	2010	2011	2012	2013	2014	2015
Urban *(Changes from previous year)*	3,671 *(-)*	3,633 *(▲38)*	3,685 *(52)*	3,657 *(▲28)*	3,475 *(▲182)*	3,888 *(413)*
Rural *(Changes from previous year)*	10,086 *(-)*	9,382 *(▲704)*	8,946 *(▲436)*	9,665 *(719)*	9,286 *(▲379)*	10,210 *(924)*
Number of Applicants in Target Schools among Rural Areas *(Changes from previous year)*	- -	-	-	-	216 *(-)*	513 *(297)*
Percentage of target schools among the number of JC exam applicants in rural areas	-	-	-	-	*2.3%*	*5.0%*

Source: Analysis from the ECOS data

Note: Students in 3 of the 12 target schools did not take the JC exam because those three schools did not have Form 3 students in 2014, as they had accepted Form 1 (starting year of junior high school) and Form 4 (starting year of senior high school) when opening the school in 2013. In 2015, students in all 12 target schools took the JC exam.

[44] The number of SGCSE applicants were not examined because it was difficult to obtain the total number of applicants as the number of applicants was only available per subject.

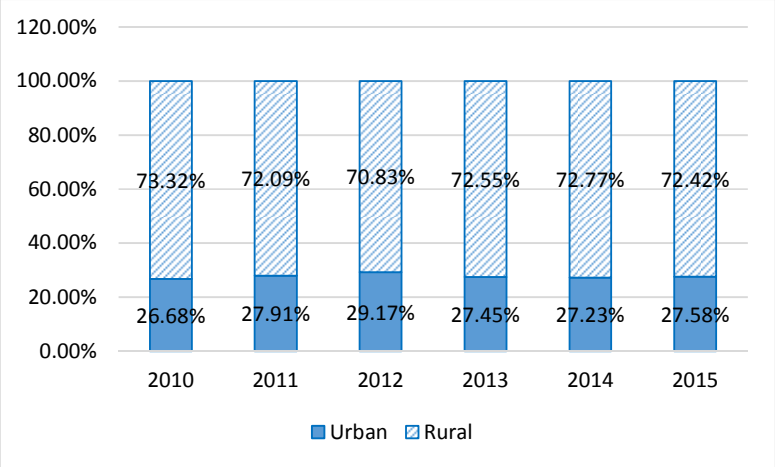
[45] According to the data available on the ECOS Web site, the grade of the SGCSE exam is indicated as A*-X (grade A* is the highest). The ratio of "Grade C and above" is also calculated on the Web site. Therefore, "Grade C and above" means "higher grade."

[46] ECOS is a "quasi-government organization" established in 1981. They have the mandate to administer examinations and issue certificates to primary, junior secondary, and senior secondary school graduates (ECOS Web site).

[47] The classification of urban and rural schools were based on the "School List 2011" (MOET) and the hearing to ECOS. Peri-urban schools were classified as urban. The schools that cannot be classified were excluded from the analysis.

[48] Though the data in 2014 has not yet been published, the repeat rate and drop-out rate of Form 1 and Form 2 have been high. According to the Annual Education Census Report 2013, the repeat rate in 2013 was: Form 1: 12.3 % (Female), 14.2 % (Male); Form 2: 14.6 % (Female), 17.5 % (Male). The drop-out rate in 2013 was: Form 1: 4.1 % (Female), 3.7 % (Male); Form 2: 4.5 % (Female), 3.7 % (Male).

As shown in Figure 3, the percentage of the number of JC exam applicants has not changed dramatically over the period of 2010 to 2015. Therefore, the project's contribution to the reduction of disparity in terms of the number of JC exam applicants between urban and rural areas has not been seen at the time of ex-post evaluation; although it can be said that the project somewhat contributed to the increased number of JC exam applicant in rural areas.



Source: Analysis from the ECOS data

Figure 3: Ratio of the Number of JC Exam Applicants in Urban and Rural Areas

(2) Contribution to the Reduction of the Disparity in Educational Quality

- Ratio of successful applicants in JC exam

Regarding the project's contribution to the reduction in the disparity of educational quality, the "difference in the ratio of successful JC exam applicants in urban and rural areas" was examined.

Table 11 shows the average ratio of successful JC exam applicants in urban and rural areas. Although the difference between urban and rural areas has tended to decrease since 2010, the difference extended in 2015. The average ratio in target schools has been lower than the average ratio of rural areas, because the ratio of respective schools was uneven. (refer to Table 11 and Figure 4). Thus, the disparity in terms of the ratio of successful JC exam applicants had not improved at the time of ex-post evaluation.

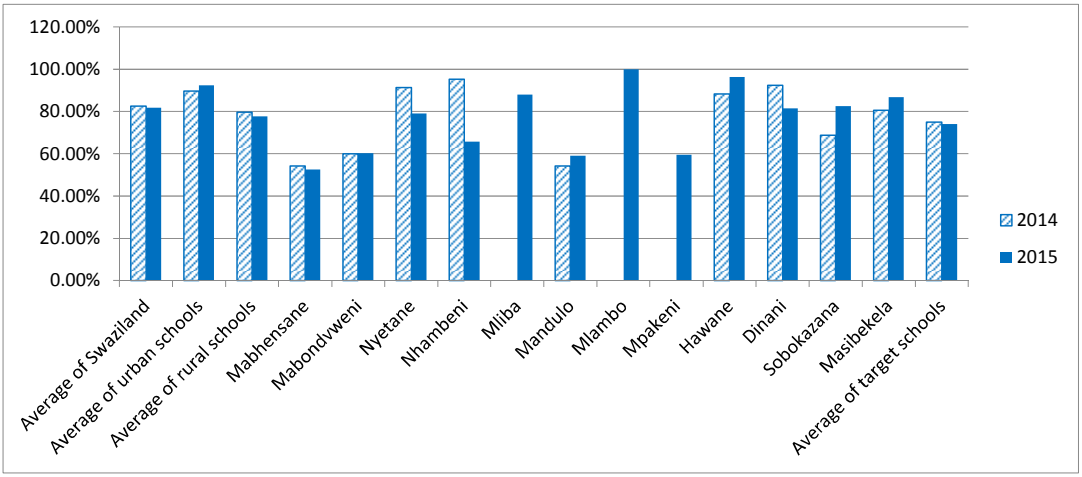
However, when examining the results of the successful JC exam applicants per subject, the average ratio of successful applicants in target areas has been higher in several subjects, such as Siswati, religious education, home economics, and consumer science, than the national average.

Table 11: Average Ratio of Successful JC Exam Applicants in Urban and Rural Areas

(Unit: %)

	2010	2011	2012	2013	2014	2015
A. Urban	91.5	90.3	90.2	89.2	89.7	91.5
B. Rural	79.4	80.8	77.8	79.4	79.7	77.7
(FYR) average ratio of successful JC exam applicants in target schools	-	-	-	-	*75.0*	*74.1*
Difference between urban and rural areas (A-B)	*12.1*	*9.5*	*12.4*	*9.8*	*10.0*	*13.8*

Source: Analysis from the ECOS data



Source: Analysis from the ECOS data

Figure 4: Ratio of Successful JC Exam Applicants per Target Schools (2014 and 2015)[49]

- Ratio of "Grade C and above" in SGCSE exam

As shown in Table 12, the difference in the average ratio of "Grade C and above" on the SGCSE exam between urban and rural areas was reduced in 2015. The average ratio in target schools also improved in 2015 compared to 2014, and it was higher than the average ratio of rural areas. In addition, it is considered that students' study performance at most target schools has improved because ten of the twelve schools improved their ratio in 2015 compared to 2014.

Therefore, the disparity in terms of the ratio of SGCSE exam "Grade C and above" between urban and rural areas has been improved (refer to Table 12 and Figure 5).

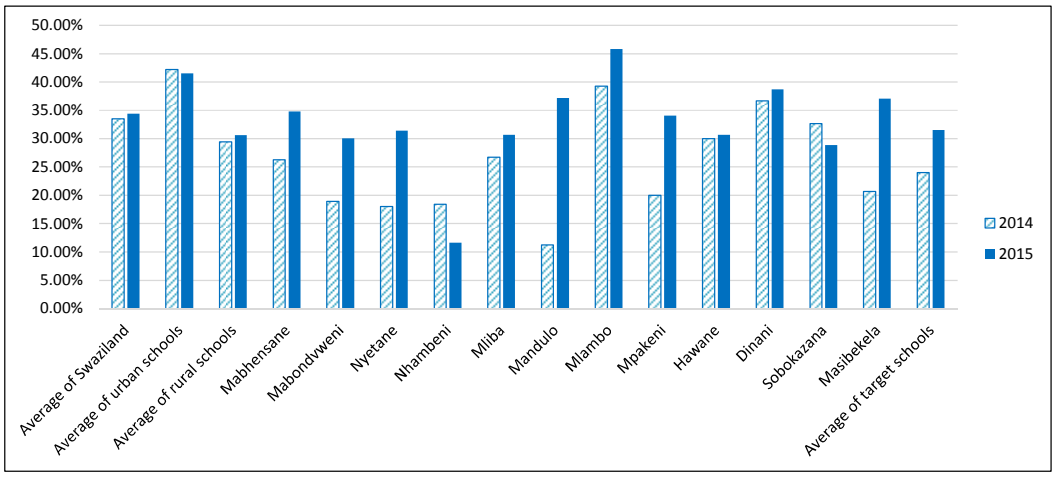
[49] Data in 2014 were not available in some schools. This is because no students took the JC exam in those schools as they did not have Form 3 students in 2014.

Table 12: Average Ratio of SGCSE Exam “Grade C and above” in Urban and Rural Areas

(Unit: %)

	2013	2014	2015
A. Urban	41.7	42.2	41.5
B. Rural	29.4	29.4	30.6
（FYR）Average ratio of SGCSE “Grade C and above” in target schools	*-*	*24.0*	*31.5*
Difference between urban and rural areas (A-B)	*12.3*	*12.8*	*10.9*

Source: Analysis from the ECOS data



Source: Analysis from the ECOS data

Figure 5: Ratio of SGCSE Exam “Grade C and above” per Target Schools (2014 and 2015)

3.4.2 Other Impacts

(1) Impacts on the Natural Environment

In Swaziland, it is mandatory that an Environmental Impact Assessment (EIA) is conducted by the Swaziland Environmental Authority (SEA) before the commencement of construction works of all development projects. An EIA for this project was also conducted before the commencement of the project.

As the result of EIA, the SEA requested MOET to submit assessment report for four sites (Mabhensane, Mabondvweni, Mliba, and Nyetane). According to MOET, the reports for the respective sites were duly submitted, and planned monitoring was also implemented[50].

Regarding waste management in the target schools, it was observed that some schools burned combustible waste in a pit, and then buried it together with the incombustible waste on

[50] The hard copies of report were confirmed during the field survey

their premises. It is common in Swaziland that waste generated from a school in rural areas is classified as "household waste," and the school has the responsibility to dispose of it. It is generally managed by digging a pit, which is located at a safe distance from living areas and drinking sources, and burning the waste in it[51]. A site visit also confirmed that the waste of target schools was burned in a safe place away from the building.

Therefore, any negative impact to the natural environment by the project was not seen at the time of ex-post evaluation.

(2) Land Acquisition and Resettlement

In regard to the land acquisition of the project, the ownership or usage rights for the land that can be confirmed in writing was listed as a precondition of the project, and the confirmation was also done in writing[52].

As for the resettlement of the residents, residents in three areas (Mandulo, Mpakeni, and Sobokazana) were required to resettle. Among them, residents of Mandulo and Mpakeni were given substitute land. The residents of Sobokazana, who were living close to the school boundary, have not been given substitute land although the negative effect to the project's implementation has not been reported. However, the head teacher mentioned that it will be a challenge for further expansion of school premises in the future.

(3) Unintended Positive/Negative Impact

Positive impacts of the project, raised by the beneficiary survey, are as follows:

- Provision of employment opportunities in the area

  By constructing a new secondary school in twelve target areas, employment opportunities of the positions of cook (total: 12), grounds man (total: 4), security (total: 17) and secretary (total: 10) have been created. Furthermore, the project has contributed to increasing work opportunities for the community by providing work for laborers when simple repairs to the school facilities are needed.

  [Details of respondents[53]: a total of 7 teachers at 5 schools (Mabondvweni, Nyetane, Mandulo, Hawane, Masibekela), 2 schools from students' group interviews (Dinani, Mliba), and 1 school from guardians' group interviews (Mabondvweni)].

[51] Referred to Water Regulation 2000 and hearing with officials in Swaziland Environmental Authority

[52] The land of Nhlambeni was originally for an agriculture project of community youth, but as it was not utilized for a long time, the community chief granted use of the land to the project. After the project's commencement, the youth began to claim the land, but it was solved with an allocation of alternative land for the youth.(Interview with MOET)

[53] Here is mentioned the number of teachers and schools. This is because the number of teachers is easy to mention, as the questionnaire survey was given to teachers. On the other hand, it is difficult to mention the number of students and guardians, because both interviews were conducted as group interviews. Group interviews to guardians were only conducted in 4 schools: Mabhensane, Mabondvweni, Nyetane, and Mandulo.

- Reduction in the number of students engaged in crime and illegal business

Before the secondary schools had been constructed by the project, some children whose parents could not afford their transportation costs were engaged in illegal business, such as the cultivation of marijuana, in order to have cash income. The project has contributed to preventing such crime by enabling children to go to nearby schools without having to afford transportation costs.

[Details of respondents: 4 teachers at 4 schools (Sobokazana, Mlambo, Dinani, and Mandulo), and 1 school from students' group interviews (Sobokazana)].

- Improved mindset of guardians in terms of secondary education

According to the guardians' group interviews, the following comments regarding their mindset in terms of secondary education were raised:

- Guardians recognized the importance of secondary education after the school was constructed near their residence, because they could come to school to see what their children were doing.
- Before the school was built, their children were very exhausted when they came home from school, and they could not do chores. What was worse, their study performances were bad, as their children had to go to distant schools. Thus, guardians had doubts about sending their children to secondary school. However, since the school had been built in their community, the guardians noticed the importance of secondary education, because their children were then able to do chores and their study performances also improved.

[Details of respondents: 6 teachers at 4 schools (Nyetane, Mandulo, Mpakeni, and Masibekela), and 4 schools from guardians' group interviews (Mabhensane, Mabondvweni, Nyetane, and Mandulo)].

- Improved mindset of the community in terms of education

By sending the students to university from the target schools, the community has been able to have confidence and hope for a bright future in their community.

[Details of respondents: 14 teachers at 8 schools (Mabhensane, Mabondvweni, Nhlambeni, Mandulo, Mlambo, Mpakeni, Hawane, and Sobokazana), and 4 schools from guardians' group interviews (Mandulo, Nyetane, Mabhensane, and Mabondvweni)].

- Promotion of education opportunities for repeater and drop-out students in the community

Before the schools were built, students who failed the exam gave up on continuing to secondary education. They dropped out because they could not afford the lodging and

transport costs of another year. After the schools were constructed in the community, those children were able to restart their secondary education. Furthermore, students who had dropped out of secondary education due to pregnancy were able to restart their secondary education while taking care of their baby without being a financial or physical burden.

[Details of respondents: 12 teachers at 9 schools (Mabondvweni, Nhlambeni, Mliba, Mandulo, Mlambo, Mpakeni, Hawane, Masibekela, and Sobokazana), 1 school from students' group interviews (Mpakeni), and 2 schools from guardians' group interviews (Mabhensane and Nyetane)].

As explained above, 2,961 students enrolled in the twelve target schools in 2015, the time of ex-post evaluation. Thus, opportunities for secondary education in the targeted areas were enhanced by the project. It can also be said that the educational environment in the targeted areas was improved, as 222 teachers were allocated to rural target schools, and the results of the satisfaction survey to students and teachers regarding the school facilities were generally positive. The commuting distance/time of the students to school has been reduced because children in the target areas are able to enroll at the nearby secondary schools. According to the students' group interviews, many students responded that they can commute to school in less than one hour on foot. Thus, their commuting environment has been improved.

Regarding the project's contribution to reducing the educational disparity between urban and rural areas, the reduction of such disparity in terms of educational opportunities was not confirmed at the time of ex-post evaluation as the project's contribution was not high in light of the fact that the twelve target schools constituted only 4.4% of the total number of secondary schools in Swaziland (total of 273 schools in 2013). However, the project has contributed in terms of educational quality. Furthermore, several positive impacts were observed through the beneficiary survey.

From the above, this project largely achieved its objectives. Therefore, the effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The school committee, consisting of a head teacher, teachers, representatives of guardians, and representatives of the community chief, has a responsibility for decision-making regarding the operation and maintenance of their school facilities. Periodic checks of the school facilities are conducted by the school committee. Simple repair work, such as fixing furniture and facilities, is performed by grounds men employed by the school or by guardians. Repair work

that requires technical skills, such as electric repair and water problems, is outsourced[54].

3.5.2 Technical Aspects of Operation and Maintenance

The simple maintenance of the school facilities is done by the grounds men (including the security officer who also works as a ground man in some cases) or by guardians in most of the target schools. Guardians are not only providing their support to the facility's maintenance, but they also provide their support to the construction of new school facilities. For example, it was observed in one school that guardians were mortaring the interior wall for a newly constructed agriculture laboratory. The maintenance that requires technical skills, such as electricity and water is outsourced. Given this, no major problems have been observed in the technical aspects of operation and maintenance.

3.5.3 Financial Aspects of Operation and Maintenance

Salaries and transportation costs of the teachers are covered by MOET's budget allocated from the national budget. The percentage of budget allocation to MOET has been 17-18%, and it has been stable since 2011 (refer to Table 13). However, according to the interview with MOET, it is not definite that the same allocation will be sustained continuously in the future because the government's income has been decreasing in recent years due to a decline in Southern Africa Custom Union (SACU) revenue, as the major source of government income is SACU revenue sharing. Thus, MOET needs to consider mobilizing funding from other sources other than the government.

Table 13: Budget Allocation to MOET

(Unit: Thousands emalangeni)

	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016
National Budget	**9,968,129**	**11,553,765**	**13,236,150**	**15,306,807**	**15,952,241**
Allocation to MOET from National Budget	**1,800,264**	**2,146,886**	**2,223,797**	**2,640,935**	**2,758,360**
Operating Budget	*1,744,705*	*2,039,480*	*2,170,867*	*2,453,039*	*2,758,194*
Development Budget	*55,559*	*107,406*	*52,930*	*187,896*	*166*
Percentage of the National Budget	18.1%	18.6%	16.8%	17.3%	17.3%

Source: MOET's questionnaire response

[54] According to MOET, the Ministry of Public Works and Transport is responsible for maintaining government buildings, including public schools. According to the site survey, there were cases wherein the school requested the maintenance of teachers' housing units and the construction of playing fields. However, due to the long process of accepting the request, urgent issues have not seemed to be requested. Although the official response from the Ministry of Public Works and Transport is not received, they seem to not be interested in small maintenance jobs, such as school maintenance, as they are also responsible for maintaining public infrastructures like the country's roads (Official site of Ministry of Public Works and Transport, Preparatory Survey for the Education Programmes in the Kingdom of Lesotho and the Kingdom of Swaziland 2009).

On the other hand, the expenditures related to the maintenance and operation of school facilities are covered by school fees collected by each school. The amount of the school fee is set by the respective schools. Nevertheless, as mentioned below in Table 14, more than half of the students in most schools are "orphans and vulnerable children (OVC)," and their school fees are exempted. The school receives a grant from the government for OVC students that is 1,950 emalangeni for respective students of Form 1, 2, 3, and 5 and 2,500 emalangeni for respective Form 4 students per year. The OVC grant for Form 4 students is set higher than other forms in consideration of the need to prepare learning material for senior secondary schools due to the starting year of senior secondary school education[55].

Table 14: School Fee per Year and Percentage Number of OVC Students in Target School (2015)

Target School	School Fee (owed by guardians) / Year / Student（emalangeni）	Number of Students	Number of OVC Students	Percentage of OVC Students
Mabhensane	2,750(F1-F2), 2,850(F3), 3,080(F4-F5)	280	252	90%
Mabondvweni	3,248(F1-F3), 3,410(F4-F5)	258	245	95%
Nyetane	3,465(F1-F3), 4,070(F4-F5)	300	197	66%
Nhlambeni	4,250(F1-F3), 5,050(F4), 4,950(F5)	210	114	54%
Mliba	3,575(F1-F5)	392	246	63%
Mandulo	3,730(F1-F5)	244	184	75%
Mlambo	2,535(F1-F3,F5), 2,885(F4)	198	100	51%
Mpakeni	3,115(F1-F3), 3,145(F4-F5)	238	206	87%
Hawane	3,900(F1-F5)	183	120	66%
Dinani (Etfuntini)	3,520(F1-F5)	265	144	54%
Sobokazana (Hhelehhele)	3,650(F1-F5)	182	93	51%
Masibekela (Mantabeni)	3,950(F1-F5)	211	103	49%

Source: Questionnaire survey with target schools

According to the interviews with the head teachers, there is no school whose expenditure exceeds its income, as they adjust the operation and maintenance expense by prioritizing in accordance with their income[56]. However, it is difficult for each school to secure the sufficient amount for operation and maintenance costs due to the large proportion of OVC students, as

[55] "Orphans and vulnerable children" is defined as children whose parents (one or both) have died, or children from destitute families (hearing with target schools). The numbers of OVC students are counted by the head teacher according to requests from the community, then they make an application to MOET through the Regional Education Office (Preparatory Survey for the Education Programme in the Kingdom of Lesotho and the Kingdom of Swaziland 2009). Some schools collect top-up fees for exam fees and textbooks from guardians, even if the students are acknowledged as OVC students.

[56] Actual income and expenditure of target schools in 2014 and 2015 have been confirmed by questionnaire and balance sheets submitted by the schools.

OVC grants are less than the school fees set by respective schools[57].Furthermore, it was pointed out from the head teachers that one of the challenges is a delay in payment by both guardians and government.

As a result, the schools are facing the following challenges: “They cannot repair their facilities quickly,” “They often cannot ask technicians to fix water and electricity problem as they cannot provide for the transportation cost for the technicians who lives far away,” “They have to rent textbooks instead of purchasing as the price of textbooks is high, and they currently cannot afford them,” “They cannot or are taking time to update school facilities such as new classroom structures and school halls,” and “They cannot or are taking time to construct additional school facilities, such as an agriculture laboratory, fashion and fabric room, and sports field, to provide a better curriculum quickly.”

3.5.4 Current Status of Operation and Maintenance

Through the visual observation during the site survey, the condition of the school facilities and furniture was generally good, and well maintained, though it varies depending on the respective schools. The major issues that were commonly observed were shown in Table 15. The reason for these issues is considered to be the delay of repairs due to the financial problems mentioned above. Damage to the fireplace as well as the broken door handles were pointed out and a suggestion regarding the daily use was given by the Japanese consultant at the time of the defect inspection one year after completion. Thus, it is conceived that those issues are caused by the daily use of facilities.

The termite issue was observed in the science laboratory at Mabondvweni. An anti-termite soil poisoning was required in the principal building agreement with the contractors and MOET and the schools have a right to claim under the “latent defect” for five-year period from the date of final completion. Therefore, the issue is expected to be resolved through MOET.

Table 15: Major Issues of Facilities Observed During the Site Visit

Issue Observed	Number of Schools Observed [58]	Details of Observation
Damage to the fireplace (kitchen)	7	It has a risk; the cooking stove will not be used due to the damage of the base supporting the cooking stove, if it will be left unrepaired.
Damaged floor (classroom, science lab)	6	The following were pointed out, although no serious problem was found: -Difficult to wipe the floor -Not good in appearance

[57] According to the interview with MOET officials, the amount of OVC grant has not been raised for last five years although the increase of the OVC grant has been discussed.
[58] Those numbers of schools exclude the school that had fixed up the same issue.

Broken door handles and loss of keys (students' toilets)	4	Toilets' doors cannot be locked
Water leaking from the sink (H/E room)	4	Cabinet under the sink is damaged and cannot be used due to water leaking

As stated above, some minor problems have been observed in terms of the financial aspect of the operation and the maintenance system. It has brought about the small challenge in the current status of the operation and maintenance.

Therefore, the sustainability of the project's effects is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project aimed to improve the educational opportunities and environments in secondary education in target areas by constructing new secondary schools in twelve rural areas in Swaziland. This was expected to contribute to reducing the disparity in secondary education between urban and rural areas as desired by the Swazi government.

Swaziland has consistently focused on human resource development and has defined the importance of secondary education in its policy. However, the educational disparity between urban and rural areas has been a problem; at the same time, the number of secondary schools has been insufficient, while the number of students enrolled in secondary education has increased. Under such circumstances, the project's aim was consistent with Swaziland's development policy and needs. Thus, the relevance of the project implementation is high. The efficiency of this project is high, as both the project period and the costs were mostly as planned.

As a result of the project's implementation, the targeted areas' educational opportunities and environments have been improved. Although the project's contribution to reducing educational disparities between urban and rural areas has been limited because the target schools are small in proportion to all secondary schools in Swaziland, the project has contributed in terms of education quality in those target areas. Furthermore, according to the beneficiary survey, some positive changes have been observed, such as the positive changes in the perception that guardians/communities have towards secondary education. Therefore, the effectiveness as well as the impact of this project are high. Minor problems in terms of the financial aspects have been observed in respective schools; thus, the sustainability of the project's effect is fair.

In light of the above, this project is evaluated to be highly satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

<Recommendations to MOET>

(1) Careful consideration about free junior secondary education

The OVC grant from the government is less than the school fee, which has been set by the respective schools annually. It brings about financial challenges for the school's operation and maintenance; for example, they can neither repair nor construct the school facilities in a timely manner. However, under such circumstances, most schools have managed to construct new school facilities, such as an agriculture laboratory, by using the micro-project program grant in combination with school fees. Regarding the free basic education (primary and junior secondary), it will phase-in after a careful investigation in primary education, which has already been implemented since 2010 according to MOET. It is desirable that careful consideration be made in advance, such as how the government would cover the cost that is now covered by school fees, as well as how communities led by guardians would cover the 25% cost for applying to the micro-project program grant, after free education would be implemented, in order to keep the sustainability of the project.

(2) Promotion of good practice-sharing among target schools

Among the twelve target schools, Mliba constructed the fashion and fabric room in the space between the H/E room and the kitchen. During the site survey in other schools, the head teachers said they wanted to construct the fashion and fabric room in the same way as Mliba did. In addition, many good practices in terms of school operation and the construction of educational facilities were observed in each school. For example, some schools obtained the other funding resources than the school fees, and others are trying to construct barrier-free facilities with the elimination of difference in level on the floor. On the other hand, some issues such as inappropriate setting of school fees could be prevented if close information-sharing had been implemented.

It is effective for the schools, which were constructed under the same design and local condition to share and incorporate their good practices about the effective use of school facilities and school management in order to maintain the sustainability of the project.

For the enhancement of information-sharing among schools, it is desirable that MOET, which is in the position to grasp the situation of all the schools, takes initiatives to establish information-sharing framework such as:

(i) To provide the opportunity such as an annual meeting among schools to share good practices annually

(ii) To consider using the information-sharing tools such as a mailing list, as most teachers at the schools can access e-mail and social network services

(iii) To introduce good practices through MOET Web site

<Recommendations to target schools>

Consideration for the effective operation and maintenance of school facilities

As stated above, the common issues of maintenance observed at some target schools are regarded to be resulting from the improper routine management and the way of daily use. On the other hand, each school depends upon the school fee for the maintenance, which is insufficient and makes it difficult to repair facilities in a timely manner. In this way, shortage of financial resources is hindering daily maintenance. As for the school fee, the proportion of OCV students is high, and the guardians are not able to afford additional fees due to their financial situation. As a result, it is a serious issue for schools to secure financial resources for maintenance of the facilities.

Under such a situation, about half of the target schools have made an effort to collect funds for operation and maintenance from other financial resources, such as constructing new facilities by using the micro-project grant in combination with their school fees. Mliba and Nyetane high schools receive funding from institutions such as universities, NGOs, and churches.

It is desirable for the school to make a proactive effort to explore the possibility of collecting funds from other sources as well as involving community/guardians.

At the same time, it is recommended that the schools educate students about the appropriate use of school facilities persistently for the sake of efficient maintenance.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Close information-sharing among stakeholders and the involvement of the community during the project's implementation

This project is evaluated to be highly satisfactory. It is considered that a high commitment of implementing agency (namely MOET) and a high ownership from the communities for school operation and maintenance have contributed to this evaluation result. The background, which education sector, including secondary education, was one of the priorities in Swaziland, and which the target sites were selected from the communities that were interested in the project, is also related to their high commitment and ownership.

Also, it is considered that the close information-sharing among stakeholders and the involvement of the community in the project's implementation worked effectively for a smooth implementation of the project as well as the enhancement of the project's effect and the

promotion of ownership to stakeholders.

Although the project sites were geographically dispersed in several sites, it was agreed at the time of the project's commencement that monthly site meetings (1 lot/month) among stakeholders, i.e., MOET (implementing agency), a Japanese consultant, and local contractors, would be held at each site (6 lots x 2=12 sites). Based on this agreement, close communication among stakeholders has been done at the construction sites frequently. In addition, these site meetings were opened to the community chiefs for the purpose of promoting the community people's participation in the project. As a result, active discussion was held among the stakeholders, and sometimes the community demanded an explanation from the contractor regarding the progress of the construction when the progress was not good. It is considered that this site meeting involving the community people brought about good progress management by providing a stimulus to contractors. The construction of the school fence was implemented by the Swaziland side as a way to demarcate between MOET and community: MOET offered the building materials to each community, and the communities themselves built the fence. The community in which people participated in the project actively was able to complete the fence in a short period.

At the time of the defect inspection and at the time of ex-post evaluation survey, it was observed that the communities in which people participated actively during the project's implementation period were making efforts to further improve the environment of the education facility by voluntarily planting trees on cut-slope. Thus, frequent site visits by the implementing agency during the project's implementation period lead to understanding the situation and the needs of the community in more detail. Also, it is effective for the implementing agency to frequently communicate with the community people, who are beneficiary of the project and to involve the community from the project's implementation stage.

This leads to a smooth implementation of the project, the enhancement of project's effect, and the promotion of ownership of the stakeholders.