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The Republic of Uganda

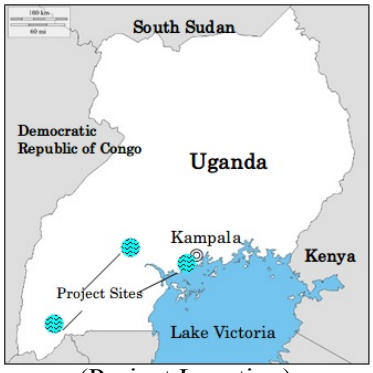
Ex-Post Evaluation of Japanese Grant Aid Project
The Project for Improvement of Medium Wave Radio Broadcasting Network

External Evaluator: Kenichi Inazawa, Octavia Japan Co., Ltd.

0. Summary

With an aim to increase the number of people who have access to medium wave (MW) radio service in Uganda, this project procured and installed a set of broadcasting equipment. At the time of the ex-post evaluation, the project remains consistent with Uganda's development policy concerning information and telecommunication networks and also with Uganda's development needs for establishing and restoring the MW radio broadcasting network and facilities. Thus the relevance of this project is high. As a result of the rehabilitation of Mawagga MW Transmitting Station and Kyeriba MW Transmitting Station, the coverage of the MW radio service has improved from 25% to 77%. Also, the procurement and installation of the latest equipment at the head studios of the implementing agency has led to the improvement in the broadcasting quality of the MW radio, which now offers a broader spectrum of programs. Furthermore, local residents are generally satisfied with the project according to the beneficiary survey. Therefore, the project demonstrates highly positive effectiveness and impacts. On the other hand, the efficiency of the project is fair because the project completion took significantly longer than planned while the project cost was within the plan. Although no major problems are observed in the technical and financial aspects of the operation and maintenance, which is carried out by the implementing agency, there are some concerns about the institutional aspects. The number of technicians at Mawagga and Kyeriba MW Transmitting Stations is too small, and the procurement and delivery of diesel fuel necessary for the emergency power generating system take a considerable amount of time. Thus the sustainability of the project is fair. In light of the above, this project is evaluated to be satisfactory.

1. Project Description



(Project Location)


Mawagga MW Radio Transmitting Station

1.1 Background

In the Republic of Uganda (hereinafter referred to as "Uganda") approximately 4 million units of radio receivers were owned with the household saturation rate of 78.1% in 2002, whereas for TV 390,000 units[1] were owned with the household saturation rate of 7.6%, which was one tenth that of radios. In fact, radio broadcasting played an important role as an information medium in Uganda since it was more accessible to people than TV. The Uganda Broadcasting Corporation (UBC), the only public radio broadcasting service provider in the country, had sufficient units of broadcasting equipment. However, most of them were procured and installed back in the 1970-80s. The aging equipment often created problems in producing and broadcasting radio programs. In addition, even though UBC was the only organization with the MW radio broadcasting system, which was best suited for a nationwide network, its regional transmitting stations were underutilized because of the old facilities. The government of Uganda recognized the urgent need to restore the functions of Mawagga MW Transmitting Station (Mubende District, Central Region) and Kyeriba MW Transmitting Station (Kabale District, Western Region) as these two stations were not in use despite their potential for reaching greater population. It was also deemed necessary to procure and install studio equipment for radio program development.

1.2 Project Outline

The objective of this project is to increase the number of people who have access to MW radio broadcasting service by procuring and installing MW radio broadcasting equipment for

[1] The source of the data concerning the numbers of radio receivers and TV sets is the International Telecommunication Union (ITU).

Mawagga MW Transmitting Station in Mubende District, Kyeriba MW Transmitting Station in Kabale District, and Kampala Broadcast House, thereby contributing to improving the people's living standard and correcting the disparities in information access among the people.

Grant Limit / Actual Grant Amount		1,112 million yen / 1,058 million yen
Exchange of Notes Date (/Grant Agreement Date)		July 2007
Implementing Agency		Uganda Broadcasting Corporation (UBC)
Project Completion Date		April 2009
Main Contractors	Construction	Mitsubishi Corporation
	Consulting Service	NHK Integrated Technology Inc.
Basic Design		August 2006 – March 2007
Detailed Design		N/A
Related Projects (if any)		[Technical Cooperation Projects] ■ Training of Local Officials in Japan (a total of 9 officials between 1977 and 2006) [ODA Loan] ■ "The Project for Expansion of Uganda Television Network" (Approximately 618 million yen, 1966) [Grant Aid] ■ "The Project for Improvement of Television Transmitting Facilities" (720 million yen, 1984) ■ "The Project for Improvement of Kololo Transmitting Station" (197 million yen, 1991)

2. Outline of the Evaluation Study

2.1 External Evaluator

Kenichi Inazawa, Octavia Japan Co., Ltd.

2.2 Duration of Evaluation Study

Duration of the Study: September 2012-August 2013

Duration of the Field Study: February 2-15, April 27-May 3, 2013

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 developed the "Poverty Eradication Action Plan (PEAP)" in 1997, which identified the following priority areas: (1) economic management; (2) improvement in production, income and competitiveness; (3) public security, resolution of conflicts, and disaster management; (4) good governance; and (5) human development. After having been revised in 2000 and 2003, the third PEAP was launched in December 2004. According to this, an emphasis was placed on crosscutting issues, such as gender, environment, HIV/AIDS, employment, population problem, social security, income distribution, and correction of regional disparities. In particular, educational and awareness raising programs through the national public radio were viewed as an important cross-sectoral approach[4].

At the time of the ex-post evaluation, the government of Uganda is implementing the "Five-year National Development Plan (2010/11-2014/15)" launched in April 2010. The plan recognizes the importance of developing information telecommunication networks for social and economic development. It also lays out the government's direction towards expanding information and communication services to regions, such as radio and television, as they are rather concentrated in the capital, Kampala. In addition to the five-year development plan, UBC and the Ministry of Information, which supervises UBC, are preparing a program to develop broadcasting network entitled, "The Improvement of UBC Broadcasting Network and Information Diffusion." In this program radio broadcasting is viewed as a tool to establish a solid base for information and communications in all regions so as to contribute to the welfare of Ugandan citizens.

As described above, the expansion of information and communication networks as well as radiobroadcast continues to be an important issue for the government of Uganda. Therefore, it is confirmed that this project remains consistent with the development policy of Uganda.

3.1.2 Relevance to the Development Needs of Uganda

Before the project, most of the equipment used at seven MW Transmitting Stations[5] and

[2] A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory
[3] ③: High, ② Fair, ① Low
[4] The PEAP states that following roles to be played by radio: (1) equitable access to education, (2) improvement of agricultural activities and health management; (3) awareness raising for citizens; and (4) learning about new techniques and technologies of various fields.
[5] Seven stations are Arua, Bobi, Butebo, Mawagga, Kibira, Bugolobi, and Kyeriba.

Kampala Broadcast House , which are the main facilities of UBC's radio broadcasting networks, was procured and installed back in the 1970-80s. Therefore, problems were often found in producing radio programs and broadcasting due to the old equipment and shortage of spare parts. UBC had seven transmitting stations in the country, with which they had the potential of reaching 90% of the national population with MW[6]. At the time of project commencement, however, Butebo was the only operational transmitting station. Consequently, the MW radio service coverage was as low as 25% of the population. To address this situation, the government of Uganda requested Japan to extend a grant aid assistance for the procurement and installation of studio equipment at the Kampala Broadcast House and also for the restoration of Mawagga MW Transmitting Station[7] (Mubende District, Central Region) and Kyeriba MW Transmitting Station[8] (Kabale District, Western Region), the two most crucial transmitting stations in terms of coverage.

At the time of the ex-post evaluation, there continues to be a demand for developing MW radio broadcasting networks. After the commencement of the project, UBC and the Ministry of Information developed "The Five-Year Strategic Plan of UBC (2008-13)", which aims to restore the other MW transmitting stations which were not covered by this project. By expanding the MW radio coverage to the entire nation in the near future, UBC aims to reduce information disparity between Kampala and the regions and provide people with more relevant information.

As described above, there continues to be a demand for developing and rehabilitating MW radio networks and facilities in Uganda. Therefore, it is judged that the project is consistent with the development needs of Uganda.

3.1.3 Relevance to Japan's ODA Policy

Following the Japan-Uganda Economic Cooperation Policy Conference in July 1997 and the Project Confirmation Study in 1999, the government of Japan advocated the following priority areas for the Official Development Assistance (ODA) to Uganda: (1) human resource development (education, vocational training, etc.); (2) support for basic human needs (health and medical infrastructure, water supply, etc.); (3) agricultural development (promotion of rice production, value addition through post-harvesting, etc.); and (4) economic infrastructure

[6] MW radio has wider geographical coverage than FM radio.
[7] Mawagga MW Transmitting Station was constructed in 1972. Initially, the station had two 50kW MW transmitters of British make which were operated using the active/standby operating system. Both of these transmitters broke after 5 years and were replaced with one Japanese 50kW transmitter in 1988. When this one broke in 1999, the broadcasting was stopped.
[8] Kyeriba Transmitting Station and Mawagga Transmitting Station began their operation with British equipment manufactured in 1972. By 1998 the equipment became extremely old, and spare parts became unavailable. Finally they stopped operating.

development (road, electric power, etc.). The continuity of these priorities was reaffirmed at the Japan-Uganda Economic Cooperation Policy Conference in October 2006, confirming the overall direction towards poverty reduction through growth.

This project is designed to contribute to education, awareness creation, and reducing information disparities among regions, which relates to "(1) human resource development (education, vocational training, etc.)" above. Therefore, it is judged that this project is consistent with Japan's ODA policy. Additionally, Japan has been active in supporting communications and broadcasting sector in Uganda. Following the "The Project for Improvement of Television Transmission Facilities" in 1984 and the "The Project for Improvement of Kololo Transmitting Station" in 1991, this project is designed to improve information infrastructure by procuring and installing broadcasting equipment so as to contribute to the improvement in the living and educational standards of Ugandan citizens. Therefore, it can be said that this project is consistent with Japan's ODA policy to Uganda.

This project has been highly relevant with Uganda's development plan, development needs, as well as Japan's ODA policy; therefore its relevance is high.

3.2 Effectiveness[9] (Rating: ③)

3.2.1 Quantitative Effects (Operation and Effect Indicators)

1) Direct Effects of the Project (MW Radio Broadcasting Coverage: Area and Population)

It was expected before project implementation that this project would improve UBC's MW radio broadcasting coverage from 25% to 75%, with 7.25 million people in Central Region and 6.9 million people in Western Region (totally 14.15 million people) gaining access to the MW radio broadcasting service. Table 1 shows the coverage of UBC's MW broadcasting service (population) and the numbers of people served by Mawagga and Kyeriba MW Transmitting Stations before project implementation (actual) and after project completion (target and actual).

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

Table 1: Data concerning Direct Effects of the Project
(Before Project Implementation, Target, and Actual after Project Completion)

Effect Indicators	Before Project Implementation	Target after Project Completion	Actual after Project Completion (At Ex-Post Evaluation in 2012)
(1) Coverage of UBC's MW Radio Broadcasting Service	25%[10]	77%[11]	77%[12]
(2) Number of People served by Mawagga and Kyeriba MW Transmitting Stations	0	14.15 million people	Approximately 17.29 million people

Source: JICA document and answer on questionnaire

Following the completion of this project, the coverage of MW radio broadcasting service has expanded, particularly in Central and Western Regions. As shown in Table 1, MW broadcasting service covers 77% of the nation or 17.29 million people at the time of the ex-post evaluation. Now, it appears as if the number of people served by the two stations exceeded the original target. However, it was largely attributed to the rapid population growth[13]. Considering that the equipment was procured and installed at Mawagga and Kyeriba Transmitting Stations as planned, which will be discussed later in 'Project Output' under 'Efficiency', and that no problem has been reported about the breakdown and failure of the equipment thus far[14], it is no surprise that the coverage has expanded as planned. Nevertheless, it can be said that the project is contributing to the stable provision of MW broadcasting service.

2) Radio and Television Saturation Rates of the Nation

Table 2 provides the data concerning radio and television saturation at the national level. The radio saturation rate is 66.0% at the time of the ex-post evaluation, which is higher than the television saturation rate of 12.4%. Now, comparing 66.0% to 78.1% (rate before project

[10] This 25% was calculated by dividing the number of people residing in the area covered by Butebo Transmission Station by the national population.
[11] This figure indicates the coverage of the three transmitting stations: Butebo (Eastern Region), Mawagga (Central Region), and Kyeriba (Western Region). Because Mawagga and Kyeriba Transmission Stations can serve 52% of the national population, 77% was derived by adding 52% to 25%. As was the case for the coverage of Butebo Station, 52% was calculated by dividing the number of people residing in the areas covered by the two stations, assuming that population grew at the same rate across the country by the national population.
[12] According to UBC, the operation of Butebo Transmitting Station, the only station which was operational before project commencement, is currently unstable due to the breakage of the diode system of the semiconductor inside the transmitter (as of mid February 2013). Although UBC is trying to coop with the problem by assigning experienced staff for the recovery work, they have not been able to procure and install the needed spare parts. According to one staff member, UBC is hoping to stabilize the function of this station by August 2013.
[13] The population growth rate is 3.1% as of 2013 (UNFPA data), which is the third highest in the world according to the "State of World Population 2011" published by UNFPA.
[14] It will be further discussed in '3.5.4 Current Status of Operation and Maintenance.'

commencement), it appears as if the radio saturation is lower at the time of the ex-post evaluation than it was before project commencement. However, the data provided by Audience Scapes, a private research institution, shows the radio saturation rate of 83.0%[15]. UBC commented about the validity of 66.0% radio saturation rate as follows: "In recent years mobile phone users have increased dramatically in the capital, Kampala. Because more and more people use mobile phones to listen to the radio, the radio saturation rate could be higher than 66.0% in reality given the increasing number of mobile phones." Based on the above, it can be concluded that radio, which is supported by this project, continues to have a comparative advantage as a means of information gathering in Uganda[16].

Table 2: Data on Radio and Television Saturation

Item	Before Project Commencement			At the Time of Ex-Post Evaluation
	1995	1998	2002	2012
Number of radio set (unit: thousand)	2,300	2,800	4,000	5,045
Number of television set (unit: thousand)	140	219	391	948
Population (unit: thousand)	19,235	21,174	24,068	34,509
Number of household (unit: thousand)	4,093	4,505	5,121	7,644
Radio saturation rate (unit: %)	56.2	62.2	78.1	66.0 (83.0) *Note
Television saturation rate (unit: %)	3.4	4.9	7.6	12.4

Source: Uganda Bureau of Statistics (UBOS), World Telecommunications Indicators Database 9th Edition 2005 and ITU for the data before project commencement, UBOS, World Telecommunications Indicators Database 16th Edition 2012, ITU and Audience Scapes's survey results for the data at the time of ex-post evaluation
Note: 66.0% is 2011 data provided by UBOS. 83.0% is 2008 data cited from Audience Scapes, a private research company.

3) Improvement of Studio Performance at Kampala Broadcast House

Before project implementation live broadcasts of Kampala Broadcast House were often interrupted by a power circuit problem resulting from voltage changes. To address this problem, this project procured and installed a set of equipment for studios at Kampala Broadcast House

[15] Audience Scapes conducted a survey on access to and utilization of radio broadcasting with a sample size of 5,797 in 2008. According to the survey results, 83% of the respondents listen to radio. When interviewed about the radio saturation rate, UBC commented: "The rate of 78.1% for 2002 seems to be an overestimate in the first place given the MW radio service coverage at that time. As far as UBC is aware, ITU, which provided this data, did not actually count the number of receivers. Instead, they simply estimated the saturation rate for Uganda based on the numbers from the neighboring countries."

[16] Although the television saturation rate is on the increase as compared to it was at the time of the ex-ante evaluation, it is still lower than the radio saturation rate. The main reasons are: (1) Television sets are not affordable to many people; and (2) Electrification rate is still low in rural areas (e.g., 5.3% as of 2012 according to UBOS statistics). While radio can be operated on batteries, electricity is necessary for television.

while restoring MW transmitting stations[17].

Table 3 shows the utilization of the studios (hour/day) for which the project procured and installed broadcasting equipment. Table 4 shows the hours of live broadcast as opposed to recorded programs before and after the project. At the time of the ex-post evaluation the studios are being utilized throughout the day. The share of recorded programs decreased as the hours of live broadcast increased[18]. Because live broadcasts used to be interrupted by a power circuit problem resulting from voltage changes before project commencement, the project has introduced an uninterruptible power system (UPS) to regulate voltage. In addition, the project installed air conditioning facilities to keep the room temperature constant in the studios, which helps control the quality of equipment. As a result, it is now possible to use the studios throughout the day, which has opened up an opportunity for UBC to produce live programs which requires higher degree of precision and accuracy. In terms of the current radio programs, news, educational programs (agriculture, health, hygiene and nutrition), talk-shows with guest politicians and cooking programs are broadcasted during the day, while music, interviews with celebrities and sports news are broadcasted in the night. Maintenance staff and radio MCs commented when interviewed that although radio programs used to be interrupted from time to time as the broadcasting equipment broke down frequently before the project, such problems do not occur after the completion of the project. Thus it can be concluded that the broadcasting quality has improved in terms of sound and stability as a result of the procurement and installation of the latest studio equipment by the project.

Table 3: Studio Use (hour/day) at Kampala Broadcast House

Studio Name	Studio Usage per day	
	Before Project Implementation	At the Time of Ex-Post Evaluation
Red[19]	9-12 hours	24 hours
West[20]	9-12 hours	24 hours
Butebo[21]	6-9 hours	24 hours

Source: JICA document (for figures before project implementation), and UBC's data (for figures at the time of the ex-post evaluation)

[17] Although it will be discussed more later in 'Project Outputs' under the 'Efficiency' section, equipment procured and installed for the production studio includes on-air studio equipment and digital audio workstation.
[18] Live broadcast has the following advantages: (1) It allows interaction with the listeners during talk shows and debate programs using phones; and (2) News can be communicated in case of emergencies, such as natural disasters and power outage.
[19] This studio is used to produce radio programs for the capital, Kampala, and around as well as for North Region.
[20] This studio is used to produce radio programs for the western part of Uganda. UBC changed the name of the studio from "Blue" to "West" following the project commencement.
[21] This studio is used to produce radio programs for the eastern part of Uganda.

Table 4: Broadcast Hours by Type (Live or Recorded Programs)

Studio Name	Before Project Implementation			At the Time of Ex-Post Evaluation		
	Hours of broadcast	Live	Recorded	Hours of broadcast	Live	Recorded [22]
Red	18 hours	14-15 hours	3-4 hours	24 hours	23 hrs. 15 min.	45 min.
West	18 hours	14-15 hours	3-4 hours	24 hours	22 hrs. 56 min.	1 hour 4 min.
Butebo	18 hours	15-16 hours	2-3 hours	24 hours	23 hrs.	1 hour

Source: JICA document (for figures before project implementation), and UBC's data (for figures at the time of the ex-post evaluation)

Figure 1: Locations of the Project Sites
(Circles show the areas covered by MW radio of the Project)

[22] The contents of the recorded programs which are broadcasted for "45 minutes to 1 hour 4 minutes per day" from each studio are mainly advertizing and CM production, which do not necessarily require live broadcast.

3.2.2 Qualitative Effects

1) Improved Reliability of Broadcast Transmitting Equipment at UBC Kampala Broadcast House, Mawagga and Kyeriba Transmitting Stations

Before the implementation of the project, UBC Kampala Broadcast House experienced frequent breakdowns and failures of the broadcast equipment. At the time of the ex-post evaluation, the incidence of equipment-related troubles reduced, and radio programs can be produced without the problems. When interviewed with the maintenance staff, technical officers, and radio MCs of UBC Kampala Broadcast House, they commented as follows: "Before the project we had to struggle with old and easy-to-break equipment. Now, we can produce radio programs with confidence." Similarly, technicians at Mawagga and Kyeriba Transmitting Stations commented as follows: "The MW radio broadcasting facilities and equipment procured by this project are functioning good. In fact, the Japanese transmitting equipment is of high quality. We can use it for long hours as long as we maintain it properly. We believe that MW radio broadcasting is more reliable and stable now than before." Based on the these comments, it can be assumed that this project has improved reliability of the broadcast transmitting equipment thereby stabilizing and improving the quality of MW radio broadcast.

Figure 2: UBC Kampala Broadcast House

Figure 3: Procured Audio Equipment

3.3 Impact

3.3.1 Intended Impacts

3.3.1.1 Improved Education and Raising Awareness of Citizens, Reduction in Information Disparities among Regions

A beneficiary survey was conducted as a part of this ex-post evaluation study for the purpose of measuring project impacts targeting local residents in the following three areas: Mityana

County, Mubende District (Central) around Mawagga Transmitting Station, Kabale County, Kabale District (Western) around Kyeriba Transmitting Station, and Central District of Kampala in the vicinity of Kampala Broadcast House. The survey used a questionnaire, and samples were drawn based on the random sampling method (sample size: 100 for three areas)[23]. Figure 4 shows whether any changes have occur in UBC's MW radio broadcasting during the last three years or not: the majority of the residents in all three areas detected some changes. Figure 5 shows what kinds of changes were detected by the residents: many of the respondents pointed to the fact that they became able to receive clearer radio transmission. It can be assumed that the quality of the MW radio broadcast has improved as a result of the procurement and installation of the broadcasting and transmitting equipment at Mawagga and Kyeriba Transmitting Stations. Figure 6 shows the level of satisfaction with UBC's MW radio broadcast: the result is generally positive among the residents. Those who responded either "very satisfied" or "satisfied" were asked why: they said that they were satisfied with the contents of the news, sports, and entertainment (music) programs. In addition, they pointed out that the sound became clearer over the last three years. Furthermore, as shown in Figure 7-10, many respondents think that MW radio programs contribute to the improvement in education standards, health and hygiene, agriculture and increased exposure to news and international affairs. Therefore, it can be assumed that this project plays a certain role in improving people's access to information, to reducing information disparities among regions, and to improving living conditions through the provision of diverse and well-rounded programs.

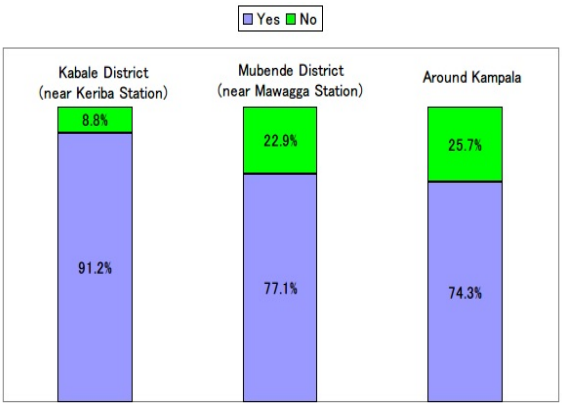


Figure 4: Do you detect any change(s) in UBC's MW radio broadcasting during the last three years?

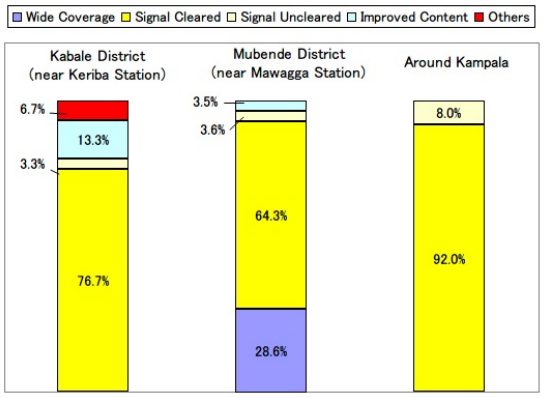


Figure 5: Reason(s) for answering "Yes" to the question in Figure 4

[23] It was not possible to capture the accurate population of each area targeted by the survey because the regional and district boundaries changed following the project commencement, and since then no census has been conducted. (Note: Although there was a plan of conducting a census in 2011, it has not been realized until now as at February 2013.)

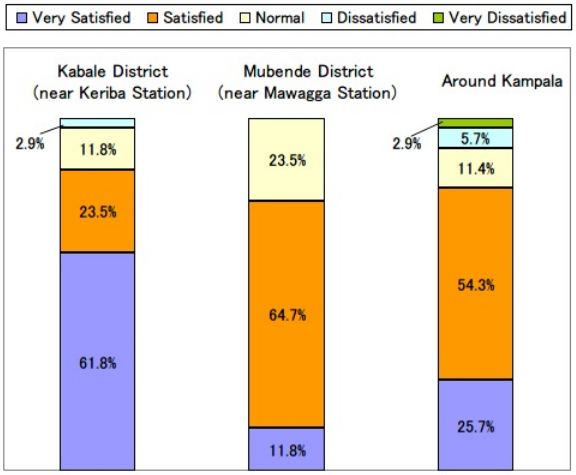


Figure 6: Are you satisfied with UBC's MW radio broadcasting service?

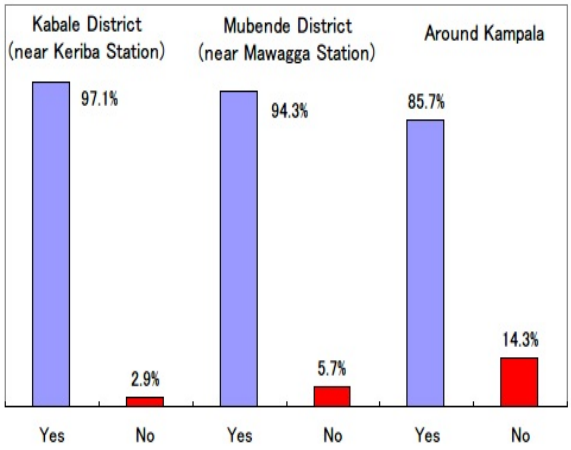


Figure 7: Do you think UBC's MW radio broadcast contributes to the improvement in educational standards?

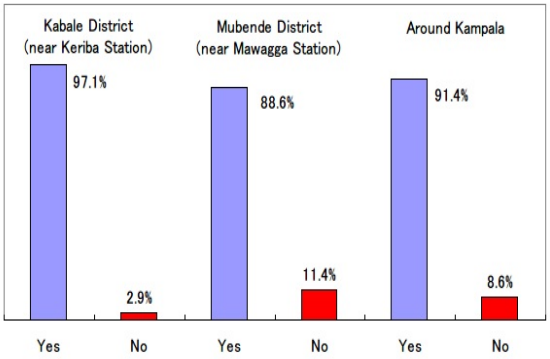


Figure 8: Do you think UBC's MW radio broadcast contributes to the improvement in health and hygiene?

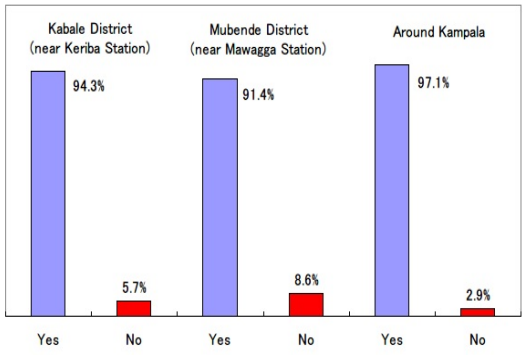


Figure 9: Do you think UBC's MW radio broadcast contributes to the improvement of agriculture?

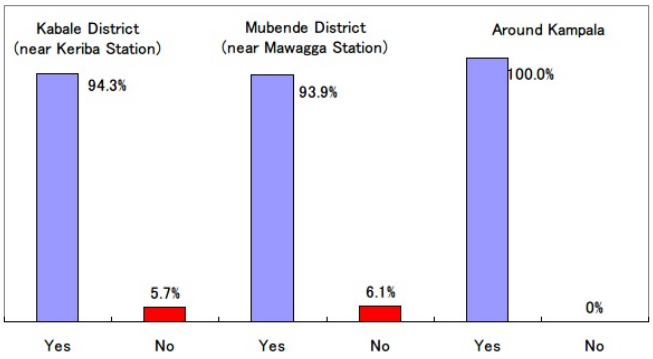


Figure 10: Do you think you listen to the news more often and are more aware of the international affairs owing to UBC's MW radio broadcast?

Some respondents commented, "I get a reception of UBC's MW radio while I am on a business trip to the neighboring countries, such as DR Congo and Rwanda[24]. Having access to local information and news while I am out of the country is quite beneficial for my business." It can be said that this comment supports the wide geographical coverage of MW radio and that UBC's MW radio broadcast is utilized by citizens to gather useful information.

When interviewed about project impacts, the Ministry of Information, a supervising body to UBC, commented as follows: "We see various impacts of this project. Taking a national election as an example, with MW radio, we can easily inform people about the announcement date, candidates, time and date of voting, access to polling places, voting method and system. As compared to FM radio, which has a limited coverage, the MW radio broadcast has advantages of covering a wide geographical area. For the government, it is an effective communication tool for disseminating public information[25]." These comments confirm that MW radio broadcast has advantages and that the project has extensive impacts.

Furthermore, the Ministry of Health commented as follows when interviewed: "We use UBC's broadcast to promote health-care programs. We think the MW radio broadcast plays an important role in improving people's knowledge about medicine and health-related issues. The existence value of MW radio is high as it is a useful communication tool to advocate health and medical programs. Since we have relatively high incidence of sporadic diseases, such as epidemics and infectious diseases (e.g., Ebola hemorrhagic fever and Marburg hemorrhagic fever[26]) in Uganda, with the MW radio which boasts a wide coverage, we can inform people of essential details, such as the place of occurrence, description of the patients, and the status of the medical response team. In addition, we can also efficiently and precisely inform people of family planning, medical centers in each area, vaccinations, maternal and child health programs in an efficient and precise manner, through the MW radio." Based on these comments it is thought that the extent of the project impacts and the significance of the project are not small.

3.3.2 Other Impacts

3.3.2.1 Impacts on the Natural Environment (Legal Procedures Concerning the Environmental and Social Considerations)

In Uganda the National Environmental Authority (NEMA), which supervises environmental

[24] When asked about the MW radio coverage in relation to this comment, UBC explained that the coverage of Mawagga and Kyeriba Transmission Stations is not limited to inside Uganda; it is possible to receive the transmission in some parts of the neighboring countries which share borders with Uganda.
[25] As a side note, 58 languages exist in Uganda. While UBC currently broadcasts in 26 languages, the effort is going to be made to increase the number of languages along with the widening of its area coverage.
[26] Both Ebola hemorrhagic fever and Marburg hemorrhagic fever are viral hemorrhagic diseases.

and social aspects of all projects, is mandated to review and approve/disapprove projects based on the National Environment Act. Concerning this project, it was required that UBC obtain an environmental-protection permission from the NEMA for the construction of transmitting station buildings and MW transmitting antennas. In fact, UBC followed the necessary steps and had the permission before project commencement. Whenever some environmental issue develops in the vicinity of the transmitting stations, NEMA is obligated to assess the situation and urge UBC to take appropriate measures as needed. According to the interviews with UBC, no environmental issues have arisen since the completion of the project.

3.3.2.2 Land Acquisition and Resettlement

No land acquisition or resettlement occurred for this project, which was confirmed through the interviews with UBC and site visits during the evaluation study.

Figure 11: Antenna System at Mawagga Transmitting Station

Figure 12: Transmitting Equipment inside Mawagga Transmitting Station

In view of the above, this project has largely achieved its objectives; therefore its effectiveness is high.

3.4 Efficiency (Rating: ②)

3.4.1 Project Outputs

Table 5 shows the planned and actual outputs of the project.

Table 5: Planned and Actual Outputs of the Project

Planned Outputs (At Appraisal)	Actual Outputs (At Ex-Post Evaluation)
【Contribution of the Japanese Side】 1) Procurement of the MW Radio Broadcasting System Equipment for Mawagga and Kyeriba Transmitting Stations • 50kW MW Transmitter: 1 set each, total 2 sets • 50kW dummy load: 1 set each, total 2 sets • Output switching unit (3-port U-link panel): 1 set each, total 2 sets • Program input and monitoring equipment: 1 lot each, total 2 lots • 50kW MW directional antenna system: 1 lot each, total 2 lots • Satellite receiving equipment: 1 lot each, total 2 lots • Lightning protector: 1 set each, total 2 sets • Automatic voltage regulator: 1 set each, total 2 sets • Isolation transformer: 1 set each, total 2 sets • Emergency generator: 1 lot each, total 2 lots • Air-conditioning and ventilation system: 1 lot each, total 2 lots • Measuring equipment: 1 lot each, total 2 lots 2) Procurement of the Equipment for Kampala Broadcast House • Equipment for 3 on-air studios: 1set each, total 3 sets • Equipment for 3 production studios: 1 set each, total 3 sets • Audio test set, spare parts, maintenance tools: 1 set 3) Installation Work, including the construction of transmitting station buildings, main and sub Antenna Tuning Unit (ATU) huts	【Contribution of the Japanese Side】 All the outputs were achieved as per the plan although there were some minor design changes.
【Contribution of the Ugandan Side】 1) Introduction of commercial power into the transmitting station buildings, which are to be constructed at Mawagga and Kyeriba MW Transmitting Stations 2) Dismantlement of the existing antenna towers at Mawagga and Kyeriba MW Transmitting Stations 3) Construction of boundary fences at	【Contribution of the Ugandan Side】 Regarding 5), although the plan was to rehabilitate the dormitories, it was changed to construction of new dormitories. All the other inputs were provided as per the plan.

Mawagga and Kyeriba MW Transmitting Station 4) Removing existing equipment and repair of the production studios at Kampala Broadcast House 5) Rehabilitation of the staff dormitories located within the premises of Mawagga and Kyeriba MW Transmitting Stations	

With regard to Table 5, the project outputs, both the ones contributed by Japan and by Uganda, were generally achieved as planned. The outputs contributed by the Japanese side had some minor design changes as follows: (1) the site for constructing a transmitting station building was changed from the proximity of the transmitting antenna to the forecourt near the staff dormitory at Kyeriba MW Transmitting Station; (2) following the change described in (1), the coaxial cable for the power feeder, connecting the main & sub ATU huts to the transmitting station buildings, was extended. With regard to one of the outputs contributed by the Ugandan side, "5) Rehabilitation of the staff dormitories located within the premises of Mawagga and Kyeriba MW Transmitting Stations," the plan of rehabilitating the existing dormitory was changed to new construction because the assessment conducted after the project commencement indicated that the existing buildings were too old and nondurable.

3.4.2 Project Inputs

3.4.2.1 Project Cost

The planned project cost was 1,146 million yen (out of which 1,112 million yen was the E/N ceiling, and 34 million yen was to be born by the Ugandan side), whereas the actual project cost was approximately 1,079 million yen (out of which 1,058 million yen was contributed by Japan, and 21 million yen was contributed by Uganda). Thus, the project cost is mostly as planned (94% of the planned cost).

3.4.2.2 Project Period

The planned project period was 1 year and 6 months (18 months) from July 2007 to March 2009. In reality, the procurement and installation, for which Japan was responsible, took 1 year and 7 months (19 months) from July 2007 to April 2009, whereas the construction work by the Ugandan side ended in May 2011. Comparing with the original plan, the actual period significantly delayed more than planned (261% of the plan):

The reasons why the procurement and installation work by Japan completed one month later

than planned are that it took the government of Uganda longer to approve the suppliers and that there were more rainy days than usual, which affected the foundation work and the equipment installation work particularly at Mawagga Transmitting Station. On the other hand, the construction work by the Ugandan side was not completed until March 2011, which is much later than the completion of the procurement and installation work by the Japanese side. It was because the budget allocation and the management's decision making concerning the construction work were significantly delayed due to the lack of communication within UBC.

Although the project cost was within the plan, the project period significantly exceeded the plan; therefore efficiency of the project is fair.

Figure 13: Emergency Generator for Kyeriba MW Transmitting Station (The one on the left is a diesel fuel storage tank.)

Figure 14: Transmitting Equipment procured for Kyeriba MW Transmitting Stations

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The implementing agency of this project is UBC. UBC is a public radio and TV broadcaster supervised by the Ministry of Information[27]. As of January 2013, UBC has about 400 employees[28].

Mawagga MW Transmitting Station and Kyeriba MW Transmitting Station each has one technical staff for the operation and maintenance (O&M). In addition to the technical staff, each

[27] UBC's managing director reports to the Ministry of Information quarterly.

[28] Out of 400, 100-120 people are working on a contractual basis. The total number of employee is higher now than it was at the time of the ex-ante evaluation (it was 270). This is because the MW radio broadcast has expanded its service area (or the coverage) and the work burden has increased. Another reason is because UBC has been placing emphasis on the TV broadcast and advertisement.

station has 8-9 employees who maintain, clean and guard the premises. An observation from the site visits is that while the only technical staff is on duty around the clock at both stations, it is necessary to increase the number of technical staff for a stable operation of the equipment and facilities. Without any backup staff, it is concerned that the MW transmission and the equipment maintenance would face problems if the technical staff fell sick or encountered an accident. On the other hand, Kampala Broadcast House has 6 employees who are responsible for the O&M of the equipment and facilities procured by the project. The staffing level seems sufficient considering the volume of equipment and required O&M.

In Uganda, supply of electricity is not stable: power outages occur rather frequently. Because of this, the project procured and installed emergency generators for both Mawagga and Kyeriba MW Transmitting Stations. The generators run on diesel. Whenever a power outage occurs, the electricity power supply is moved to the generator. However, the procurement and delivery of diesel fuel currently requires a considerable amount of time. Although both transmitting stations submit a request to UBC's headquarters to obtain fuel, the process normally gets delayed at UBC's headquarters. As a result, on rare occasions, the operation of the transmitting equipment stops at both stations[29].

3.5.2 Technical Aspects of Operation and Maintenance

During the project implementation, training was given to UBC staff members by the construction management consultants. A one-week training was given at Mawagga Transmitting Station, Kyeriba Transmitting Station, and Kampala Broadcast House for a total of 15 UBC staff members (mainly the ones responsible for the technical aspects of broadcast equipment). Since the completion of the project, UBC has been sending 2 staff members each year to a training course in Egypt to improve their skills of operating broadcasting equipment (for about two and a half months). In addition, whenever new studio equipment is introduced, UBC staff receives training from a supplier on how to use the equipment.

UBC's technicians at Mawagga and Kyeriba Transmitting Stations have sufficient professional experience to manage the broadcasting equipment procured by the project[30]: they demonstrated satisfactory levels of knowledge about the facilities and equipment during the interviews[31]. As for newly recruited employees, they receive on the job training (OJT) as needed. In view of the above, no major problems are observed in the technical aspects of the O&M of

[29] Data was not available as to how many times the operation was stopped.
[30] It is worth noting that particularly technicians have long years of experience. Some technicians have the history of taking part in training in Japan (given by NHK and others) in the 1970s.
[31] In particular, they were quite knowledgeable about the machines and spare parts of Japanese make.

this project.

3.5.3 Financial Aspects of Operation and Maintenance

Table 6 provides UBC's profit and loss statement (P/L) for the last three years. In 2010/11, UBC ended in the red with its total cost exceeding the total revenue. Thereafter, UBC had its management team replaced and launched a company reform under a new managing director[32]. As a result, UBC ended in the black the following year (2011/12) by increasing its operating revenue. Operation revenue is generated from TV/radio antenna rental fees (mainly rental fees paid by commercial broadcasters to use UBC's antenna towers), charge for rights to air on TV/radio, and advertisement fees.

Table 6: UBC's Profit and Lost Statement (last three years)

(Unit: Thousand Ugandan shillings)

	2009/10[33]	2010/11	2011/12
Operating revenue	8,833,130	7,630,788	10,877,266
Non-operating revenue	3,943,022	1,891,974	882,285
Total revenue	12,776,152	9,522,762	11,759,551
Administrative cost	(4,907,371)	(5,597,435)	(6,407,354)
Facilities cost	(1,015,122)	(1,348,267)	(1,168,571)
Operating cost	(3,478,539)	(3,947,246)	(3,430,811)
Total cost	(9,401,031)	(10,892,948)	(11,006,736)
Operation Profit or Loss	3,375,120	(1,370,186)	752,815
Financial cost	(34,710)	(206,844)	(44,050)
Profit before tax	3,340,411	(1,577,030)	708,765
Software amortization	(11,602)	(8,314)	(3,370)
Property and equipment depreciation	(3,101,165)	(2,081,431)	(595,042)
Tax	-	-	-
Current term net profit or loss	227,644	(3,666,775)	110,352

Source: UBC

Note: One thousand Ugandan shillings is roughly 30 Japanese yen (as of January 2013)

Because UBC is a national public broadcaster, it is subsidized by the government of Uganda

[32] As a site note, in 2010/11 business efforts by UBC remained low comparing with other years, and UBC's costs associated with administration, facilities, and operation were higher than the previous year. UBC then made an effort to improve its management and operation towards the following year.

[33] The fiscal year starts in the beginning of July and ends at the end of June in Uganda.

(3,667,175 thousand Ugandan shillings in 2009/10, 1,546,272 thousand shillings in 2010/11, and 740,000 thousand shillings in 2011/12). The subsidies constitute the major part of the "non-operating revenue" in Table 6. The amount of subsidies has been declining in recent years mainly because of the increase in operating revenue.

Table 7 below provides the statement of changes in equity, which shows UBC's accumulated profit or loss and changes in equity. Although there was a loss of 3,666,775 thousand shillings in 2010/11 as seen in Table 6, it was covered by the amount brought forward (retained earnings), which was 12,489,909 thousand shillings, resulting in the balance of positive 11,439,808 thousand shillings at the end of the term. In 2009/10 capital was increased by 23,042,304 thousand shillings using the government subsidy. Considering that UBC's capital and retained profits are large enough to cover the deficit balance, no major problems are observed in the financial aspects of the implementing partner.

Table 7: UBC's Statement of Changes in Equity (Last 3 Years)

(Unit: Thousand Ugandan shillings)

		Capital	Revaluation Reserve	Amount Brought Forward	Total
2009/10	Opening balance	6,159,857	25,408,709	(1,545,024)	30,023,542
	Current ordinary profit or loss	-	-	126,457	126,457
	Change in the amount carried forward	-	(4,461,291)	4,461,291	-
	Change in capital	23,042,304	-	-	23,042,304
	Prior period adjustments	-	-	-	-
	Closing balance	29,202,162	20,947,418	3,042,723	53,192,303
2010/11	Opening balance	29,202,162	20,947,418	3,042,723	53,192,303
	Current ordinary profit or loss	-	-	(3,666,775)	(3,666,775)
	Change in the amount carried forward	-	(12,489,909)	12,489,909	-
	Change in capital	210,000	-	(210,000)	-
	Prior period adjustments	-	-	(216,050)	(216,050)
	Closing balance	29,412,162	8,457,509	11,439,808	49,309,479
2011/12	Opening balance	29,412,162	8,457,509	11,439,808	49,309,479
	Current ordinary profit or loss	-	-	110,352	110,352
	Change in the amount carried forward	-	-	-	-
	Change in capital	-	-	-	-
	Prior period adjustments	-	-	-	-
	Closing balance	29,412,162	8,457,509	11,550,160	49,419,832

Source: UBC

Note: One thousand Ugandan shillings is roughly 30 Japanese yen (as of January 2013)

Regarding costs required to operate and maintain Kampala Broadcast House, Mawagga and Kyeriba Transmitting Stations, UBC commented as follows in an interview: "Because all O&M costs are administered by UBC headquarters, we do not keep records of O&M costs for each station/broadcast house separately. Mawagga and Kyeriba Transmitting Stations as well as Kampala Broadcast House together account for around 20-30% of UBC's administrative cost, facilities cost, and operating cost shown in Table 6. These are used for paying salaries to the technicians and maintenance staff, for operating facilities, and for purchasing equipment. The headquarters has been disbursing funds to the transmitting stations without delay, and the amount has been increasing from year to year." Staff working at the transmitting stations commented in an interview, "So far we have not experienced any maintenance problem attributed to the shortage of O&M budget." In view of the above, it can be concluded that no major problems are observed in the budgetary aspects of the O&M of this project.

3.5.4 Current Status of Operation and Maintenance

Through this ex-post evaluation no problems have been observed in the status of O&M concerning equipment procured and installed for Mawagga and Kyeriba Transmitting Stations, including 50kW MW Transmitters and lightning protectors, as well as equipment procured and installed for the on-air and production studios at Kampala Broadcast House. In terms of the content of the O&M, they regularly clean and check the operational status of the equipment and the timing of parts replacement based on a check list found in the maintenance manual[34]. Through the interviews with the technicians and the site visits during the field study, it is confirmed that equipment is operated properly without any defects or failures. On the other hand, as mentioned in '3.5.1 Institutional Aspects of Operation and Maintenance,' it is also a fact that the procurement and delivery of diesel fuel necessary for the emergency generators requires a considerable amount of time.

Through this project, the premises of Mawagga and Kyeriba Transmitting Stations were fenced to restrict the access of unauthorized persons[35]. Similarly, the base of the directional antenna system was fenced by the project as a part of the Japan's contribution. As a result, safety has improved in and around the transmitting stations. According to the technicians working at the transmitting stations who were interviewed, no accident has occurred since the completion of the project. In addition, a comment was received concerning the fence that it has

[34] Both Mawagga and Kyeriba Transmitting Stations have maintenance manuals, which are utilized by O&M staff for day-to-day activities as needed.
[35] It was financed by the Ugandan side as described in "Project Outputs" section under "Efficiency" above.

improved security: staff can now carry out their activities without worrying about suspicious individuals entering into the premises.

Concerning the working hours, as discussed above, technicians at Mawagga and Kyeriba Transmitting Stations lives in the dormitories located inside the premises and work almost around the clock. As for the O&M staff at Kampala Broadcast House, they normally work from 8am to 5pm, Monday through Friday, although they do come into work on weekends and holidays in case of emergencies, such as natural disasters.

With regard to spare parts, they are kept at Mawagga and Kyeriba Transmitting Stations as well as at Kampala Broadcast House. The transmitting stations procure spare parts by requesting to UBC's headquarters and store them. Generally, it takes longer to procure spare parts internationally although it depends also on the types of parts[36]. While it was not confirmed through the field visits that sufficient spare parts are stocked to prevent a transmission interruption, it was confirmed that UBC keeps a record of spare parts and stores them in a proper manner. Although ledgers are used for the management of spare parts, shortage does occur on rare occasions[37].

At the time of ex-post evaluation no major problems are observed in the technical and financial aspects of the O&M carried out by UBC. However, there are some concerns in terms of the institutional aspects of the O&M, such as the insufficient number of technicians at Mawagga and Kyeriba Transmitting Stations and the lengthy process of fuel procurement and delivery. Therefore, sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

With an aim to increase the number of people who have access to medium wave (MW) radio service in Uganda, this project procured and installed a set of broadcasting equipment. At the time of the ex-post evaluation, the project remains consistent with Uganda's development policy concerning information and telecommunication networks and also with Uganda's development needs for establishing and restoring the MW radio broadcasting network and facilities. Thus the relevance of this project is high. As a result of the rehabilitation of Mawagga MW Transmitting Station and Kyeriba MW Transmitting Station, the coverage of the MW radio service has improved from 25% to 77%. Also, the procurement and installation of the latest equipment at

[36] According to UBC, it takes roughly two months for the paper work and additional two months (a total of 4 months) for the transportation and delivery.
[37] It is not at a serious level.

the head studios of the implementing agency has led to the improvement in the broadcasting quality of the MW radio, which now offers a broader spectrum of programs. Furthermore, local residents are generally satisfied with the project according to the beneficiary survey. Therefore, the project demonstrates highly positive effectiveness and impacts. On the other hand, the efficiency of the project is fair because the project completion took significantly longer than planned while the project cost was within the plan. Although no major problems are observed in the technical and financial aspects of the operation and maintenance, which is carried out by the implementing agency, there are some concerns about the institutional aspects. There are only a few technicians at Mawagga and Kyeriba MW Transmitting Stations, and the procurement and delivery of diesel fuel necessary for the emergency power generating system take a considerable amount of time. Thus the sustainability of the project is fair. In light of the above, this project is evaluated to be satisfactory.

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

■ It is recommended that the implementing agency shorten the time required for the procurement and delivery of diesel fuel so that emergency power generators would be operative whenever a power outage occurs at Mawagga and Kyeriba MW Transmitting Stations. As the lengthy procurement and delivery of fuel could affect the broadcasting of MW radio, it is recommended that the implementing agency improve its procedural and institutional aspects. In addition, as a way of being prepared for unforeseeable circumstances, it is necessary to accelerate the process of procuring spare parts with a view to preventing interruptions to the radio transmission because in some cases considerable amount of time is required to procure and transport spare parts.

■ The number of O&M technicians at Mawagga and Kyeriba MW Transmitting Stations is not sufficient. Currently, at each transmitting station, one technical person is working almost around the clock to carry out the needed maintenance and inspections: the stations are clearly understaffed. It is recommended that UBC urgently consider increasing the number of technical persons to strengthen the institutional aspects of the O&M at the transmitting stations.

4.3 Lessons Learned

■ The project period was significantly longer than planned for the outputs contributed by the

Ugandan side. It is because of the prolonged approval process and procedures within UBC concerning budget allocation and construction execution despite the repeated reminders by JICA. JICA needs to have a thorough discussion with the implementing agency about the implementation schedule and the budget execution and to establish a common understanding about the contribution of the Ugandan side before the commencement of the project. JICA would then need to follow up on the progress as needed and request the implementing agency to take appropriate measures during the project implementation.