

Ex-Post Evaluation
on
Government ICT Infrastructure Project
in Senegal

The Export-Import Bank of Korea
(Government Agency for EDCF)

EDCF Evaluation Team
(Evaluated by Kookmin University)

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I . Project Overview

1. Project Details

- Name of the Project: Government ICT Infrastructure Project in Senegal
- Name of the Borrower: The Ministry of Economy and Finance
- Project Executing Agency: Agence de l'Informatique de l'Etat (ADIE)
- Amount of the Loan: An amount in Korean Won not exceeding the equivalent of 25 Million US Dollars
- Terms of the Loan
 - Interest rate: 0.5% per annum
 - Maturity: 30 years including a grace period of 10 years

2. Project Purpose

- The Project aimed to construct a wireless government network, based upon the WiMAX technology, connecting 665 public offices in 35 cities around the country. By doing so, it aimed to increase the transparency and productivity in providing public services. It also intended to increase technical expertise of ICT engineers and technicians in Senegal by inviting them to Korea as well as by providing on-the-job training in order to enable them to provide O&M services for the WiMAX system by themselves.

3. Project Scope

- The main scope of the Project was to construct wireless public administration networks using WiMAX and LAN in 665 public offices in 35 major cities in Senegal.
 - The WiMAX network would be built to connect central and local public offices.
 - At first, two LED displays were planned to be provided to advertise government policies to citizens in Dakar, but it was replaced with providing laptop computers.
 - EDCF planned to provide necessary O&M services for one year after the completion of the Project, along with necessary consulting services for O&M and ex-post management of the system provided.

II. Introduction

- The purpose of this ex-post evaluation report is to review the outcomes of the Government ICT Infrastructure Project in Senegal (hereafter the "Project") and to draw lessons and policy implications for similar projects in the future.

- The Project was a typical e-Government loan project of EDCF aimed to increase the efficiency, effectiveness, and transparency in government management and to improve the quality of public services. By improving the public sector, the government of Senegal expected to provide market opportunity for the domestic ICT industry development along with human resource development in related ICT areas. It is expected to improve national competitiveness which will, in turn, help achieve economic development. It is also expected to increase the awareness of ICT and information society development among public employees and raise the public awareness.

- At the time the Project was being discussed between EDCF and the Senegalese government, there was very high demand for establishing the e-government infrastructure. Before the Project was launched, the Senegalese government did not have its own broadband networks and used commercial lines for all government communications at both central and local levels. Since the Senegalese government had long-term plans to serve as an e-government and ICT hub for West African countries, the construction of the broadband communication infrastructure was given a high policy priority. The government had invited both China and Korea for infrastructure construction. It discussed constructing a backbone network using optic fibre with China, while asking EDCF of Korea to support connecting public offices by using wireless backhaul networks.

- At the beginning, the Project's goal was to construct a basic e-Government network which connects all government ministries and departments in 35 different districts in Senegal, through establishing a wireless backhaul network. Among 35 regions, 7 regions (427 public offices) already had a backbone network, but the remaining 28 districts in which 238 public facilities were located did not. Backbone networks in these regions were supposed to be provided with Chinese aid. Before the backbone network was constructed, the Senegalese government planned to lease a commercial backbone line to be connected with the backhaul network that was going to be constructed with EDCF's funding. In the end, however, both Chinese plan and the Senegalese government plan were not realized by the time the Project was completed because Chinese aid was not disbursed until 2012 and the government of Senegal, ADIE in particular, failed to mobilize the necessary budget. As a result, the Korean PMC (Project Management Company) had to construct the backhaul network first and wait until the backbone network was constructed.

- EDCF and ADIE were very cooperative in adapting to the changed environment of the Project. As of August 2016 when the ex-post evaluation was undertaken, the backbone network with optic fibre had not been constructed yet while the Project itself was completed. The evaluation showed that the output was being actively used by 427 public offices that had been connected by the Project. The remaining 238 public offices in 28 regions, however, were still not connected to the backhaul network. As a result, these offices have been using commercial internet services.

- After the construction, ADIE and MEFP were mostly satisfied with the outputs; users in B/S (Base Station) & S/S (Subscriber Station) also expressed overall satisfaction. As part of the Project, PMC had provided

technical training and education for ADIE engineers, but it turned out that the training program was not enough to provide necessary technical support for using and maintaining the WiMAX system.

- Another issue that some ADIE engineers complained was related to the inappropriateness of the WiMAX technology. They argued that WiMAX was now obsolete technology, which makes ADIE unable to upgrade the system for better services.

- WiMAX was an emerging 4G mobile communication technology when the Project was launched. When the Project was agreed upon between ADIE and EDCF, high public officials of Senegal visited Korea and saw the fast and reliable services that were provided by WiMAX. At that time, LTE technology was not available on the market. After seeing the WiMAX system, the Senegalese government requested to change the original plan, which was supposed to provide 3G mobile communication technology, mesh WiFi, to WiMAX. Later on, LTE was adopted as a standard 4G technology, while WiMAX had been diminishing from the market over time. But the evaluation found that the parts and components for the WiMAX system were still available in the world market, meaning that ADIE could purchase any parts and components if needed for repairing purposes. After five to ten years of services, the system requires to be upgraded, and ADIE can adopt new technologies, possibly 5G mobile communication technology later in the future.

- Overall, it was evaluated in this study that the Project itself had been completed as originally planned. The part that was not fully completed was mainly due to the unkept financial promise made by the recipient country government. Thus, it is recommended that EDCF and the PMC prepare a more careful risk management plan when there is any financial obligation that has to be provided by the recipient country.

III. Methods and Outcomes of Evaluation

1. Methods of Evaluation

- We have engaged in an ex-post evaluation by applying several evaluation guidelines provided by the International Development Cooperation Committee within the Office of the Prime Minister, EDCF evaluation manual, and EDCF ex-post evaluation report guidelines. We have adopted the OECD DAC model for performance evaluation by using six criteria: relevance, efficiency, effectiveness, impact, sustainability, and cross-cutting issues.

2. Outcomes of Evaluation

- The Project was evaluated as "successful" according to the evaluation guidelines provided by EDCF. The overall score in this ex-post evaluation on five criteria except the cross-cutting issues was 2.9 out of 4.0 as shown in the table below.

<Total Evaluation Chart>

Evaluation Criteria	Weighted Value	Classification	Value
Relevance	20%	Relevant	3.0
Efficiency	20%	Efficient	3.5
Effectiveness	20%	Effective	3.0
Impact	20%	Influential	3.0
Sustainability	20%	Sustainable	2.0
Comprehensive Evaluation Score		Successful	2.9/4.0

A. Relevance

- The Project was well selected based upon the needs of the government of Senegal, and was highly relevant to EDCF's support strategy. It was aligned with the upper level economic development plans of the recipient country as well. However, it was too optimistic in estimating the capability of financial mobilization on the part of the recipient organization. It is necessary to prepare an effective risk management system when there is financial obligation to be met by the recipient organization in the Project.

B. Efficiency

- The Project period had been delayed by thirteen months due to the inability to mobilize the necessary budget as promised by the recipient organization, ADIE. The period for operation and management (O&M) was also delayed. But other than that, the Project was implemented efficiently according to the close cooperation among ADIE, EDCF, and the PMC.
- The PMC had been patient by waiting for about 13 months for the completion of backbone network construction and had been cooperative by providing extended O&M services. Nevertheless, the backbone network was not ready after 13 months of waiting. Both ADIE and the PMC agreed to complete the Project by providing the backhaul network ready to be connected to 238 public offices when ADIE provides the backbone network.

C. Effectiveness

- This Project was evaluated as "partially effective" because of the unconnected areas. Other than that, most of the users whom we met during the field study expressed high satisfaction about the provided system in terms of the network speed, stability, and basic facilities. In particular, most people in public offices connected to the government network commonly pointed out the benefits of saving telecommunication bills.

D. Impact

- Although the Project was not fully completed as was originally planned, it appeared that the overall impact was quite positive. In 427 public offices that were connected by WiMAX, people commonly identified that overall efficiency had been improved in terms of transparency, interactions among public offices, and awareness of the information society. In addition, public officials who were using the system had recognized the value of information infrastructure, and increased communications among themselves. For example, judges could access court cases and related laws immediately even in the middle of court sessions. School teachers and students could access a number of online education materials in real time within the range of the WiMAX system.
- But ICT expertise regarding e-government and WiMAX system was not strengthened as was expected due partly to the short time and limited number of people who were trained in Korea and through onsite training and education. In addition, online political participation among the general public did not significantly increase.

E. Sustainability

- The Project was evaluated as "partially sustainable." The Senegalese government was working hard to complete the Project through the construction of the backbone network. As pointed out earlier, some ADIE engineers had complained about the technical limits of WiMAX, which was driven by the failure of WiMAX in the standardization of the global wireless 4G market.

- Thus although upgrading was not readily available in WiMAX technology, it was not something that people could know well before LTE technology was on the market. In addition, parts and components of WiMAX are still available in the global market, meaning that maintenance would not be problematic. The main constraints were the incompleteness of the planned backbone network due to the technical limits of ADIE as well as ADIE's failure to secure necessary budget to maximize the potential benefits of the WiMAX system.

F. Cross-cutting Issues

- There are no gender-related issues regarding the Project.

- There are no environmental issues regarding the Project.

IV. Lessons Learned and Recommendations

1. Lessons Learned

1.1 Success Factors

- Although the Project has been altered several times in contents and scope including the changes in construction locations of guy towers and antenna poles, it was completed within the planned budget thanks to the flexible and appropriate responses by the PMC and EDCF.

- Now the sustainability of the Project is in the hands of the recipient country. If ADIE has high ownership over the Project, and provides appropriate maintenance, the benefits of the Project would last longer, and some problems that were found by this ex-post evaluation can be resolved.

1.2 Limitations

- The Senegalese government decided to conduct two ODA projects to build its public administration networks. One was about the construction of the backbone networks with fiber optic cables, which was aided by the Chinese government. The other was about the construction of the access network, which connects the backbone network and the actual users in public offices. Korea's EDCF was responsible for supporting the latter part using the WiMAX wireless communication system.

- Because of this separation, problems occurred when the backbone network construction was delayed for about three years. The access network could not be used without connecting it to the backbone

network. Thus a closely integrated management of the two projects was a precondition for the successful completion of the Project. But at the planning stage of the Project, a proper risk management plan was not developed to prepare for emergencies in case the backbone network project may not be completed as scheduled.

- In addition, US\$7 million that the Senegalese government promised to put into the Project was not mobilized at all, and the technical experts that were intended to be trained through the Project were not fully developed as planned.

- Another problem was found in the capacity building program for system operation and management. When a group of people were invited to Korea for four weeks to attend various training and education programs, it turned out that ADIE had not built sufficient expertise. In addition, it had not been running any simulation training programs for emergency situations and/or for resolving system malfunctions.

2. Recommendations

- It is highly recommended that a more detailed, flexible, and/or systematic project implementation plan be prepared before the beginning of the Project. The project implementation plan has to consider the uniqueness of ICT, e-government, as well as political economic situations in the recipient country.

- In case of ODA loans, the recipient country government and project executing agency have full authority and ownership, and all responsibilities for the project rest with them, which means all decisions over the process shall not be made by the donor country but by

themselves once the loan agreement is executed. Therefore, it is important to discuss and decide on the detailed implementation plan before the loan agreement is signed. In particular, performance management is intended to maximize the outputs and outcomes as well as to increase long-term impact. In addition, sustainability should be carefully discussed with the recipient country from the F/S stage. All potential risks involved in the project should be discussed to systematically develop risk management plans.

- E-government projects often face unique circumstances depending upon the types of projects. For instance, building infrastructure may require huge investments at the beginning, but providing ICT infrastructure does not guarantee that it would be utilized when established. Legal and institutional changes as well as key applications have to follow immediately in order to make ICT infrastructure utilized as originally planned. People are usually reluctant to adopt new technologies and services as they are familiar with the existing systems or methods. In addition, capacity building to manage ICT is required, not only to use the infrastructure and applications, but also to enable public employees and the general public to properly maintain them.

- The unique characteristics of e-government projects therefore directly affect the performance indicators and management plans of e-government ODA projects. As the number of e-government projects is steadily increasing over time, a standardized form of performance indicators can be designed for ODA projects on e-government and may be utilized as a guidance for performance management in similar projects in the future.

- One of the commonly found problems of e-government projects is related to the issue of human resource development. E-government is a

typical application of ICT in the public sector. In general, there are not enough high quality ICT experts in developing countries, especially in the public sector. Thus any e-government ODA project has a portion of increasing technical experts in the recipient country in the form of training and educating ICT engineers. For example, a four-week training program about the WiMAX system and operation was provided to ADIE engineers in Korea. In addition, various on-the-job-training (OJT) sessions were provided by the PMC in implementing the Project.

- Although these training and education programs were well-designed, there was no further program to disseminate knowledge and nurture other ADIE engineers. In addition, no further OJT for O&M was provided after the completion of the Project. Thus, it is strongly recommended that various types of training and education manuals be provided for the recipient agency to increase technical experts for itself. OJT manuals are important for the recipient agency because new engineers can be trained and educated with those manuals. Moreover, manuals for maintenance as well as users' guide should be provided to clean and maintain local S/S properly.

- If the ODA project on e-government is introducing a new system that abruptly changes the office environment dramatically, it is highly recommended that a change management system be prepared as well. The change management system would include users' education, O&M guidance, the incentive and/or disincentive system, and/or an extended warranty period. Usually, the warranty program in ICT projects lasts one-year. But e-government ODA projects need much longer warranty periods because the system settlement in the government usually takes a much longer period of time. From the very beginning of e-government ODA projects, EDCF and the recipient country should consider how long the warranty program should be, and should

consider allotting additional budget and time to make the new system fully familiarized by the users.