Republic of Senegal

FY2019 Ex-Post Evaluation of Japanese Grant Aid Project

"The Program for Emergency Water Supply for Addressing Climate Change for the Republic of Senegal"

External Evaluator: Akiko Shimizu, Value Frontier Co., Ltd

0. Summary

This project aimed to strengthen water supply capacity to address climate change by renewing the aging or broken equipment used to pump groundwater (hereinafter referred to as "EGP") in deep well water supply facilities throughout 10 target regions, and also by deploying equipment used to maintain water supply facilities (hereinafter referred to as "EMWF") and equipment for emergency water supply (hereinafter referred to as "EEW") to the regional offices of the executing agency, thereby contributing to improvements of residents' sanitary environment. The project's implementation is highly consistent with Senegal's development plans and needs and Japan's ODA policies. Therefore, the relevance of the project is high. The project's implementation and its costs were largely implemented in line with the plan, however, the project period significantly exceeded that of the original plan. Thus, the efficiency of the project is fair. Regarding the project's effects, a significant improvement in water supply rates was confirmed. In addition, the deep well water supply facilities have operated reliably throughout the rainy and dry seasons due to the replacement of old and frequently broken EGP. Some facilities had already received new equipment when the lifetime of the procured EGP expired. However, when the procured EGP was in operation, it played a significant role in strengthening the water supply capacity. Regarding the project's impacts, access to safe water has improved due to a decrease in the use of other water sources, such as shallow wells. Also, the incidence of waterborne diseases has been reduced. Moreover, cases have been confirmed in which the installation of drinking water drainage systems for livestock at deep well water supply facilities has eased water shortages for livestock, especially during the dry season; this has resulted in an increase in the number of livestock, which is an important source of income for residents. Therefore, the effectiveness and impacts of the project are high. In terms of sustainability, some problems were observed in institutional, organizational, technical, and financial aspects of the project. In addition, the procured equipment was not adequately monitored, which raises concerns regarding the current status of its operation and maintenance. Therefore, the sustainability of the project is low.

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

1. Project Description

Project Location

Equipment for emergency water supply (Water tanker) procured through the project

1.1 Background

In Senegal, concerns were raised that the risk of natural disasters, such as droughts and floods, could be increased due to naturally dry conditions and climate change. Especially in rural areas, where access to safe drinking water was poor, the supply volume of water sources, such as surface water and shallow wells, was decreasing due to droughts and groundwater reduction, such that the dependence on existing deep well water supply facilities was increasing. However, some deep well water supply facilities were not operating due to frequent malfunctions in aging EGP, such as motor pumps and generators, and also owing to the lack of EMWF, which were used to repair the damaged EGP.

Meanwhile, at the World Economic Forum in Davos in 2008, the Japanese government announced to establish a $10 billion-dollar financial mechanism (hereinafter referred to as the *"Cool Earth Partnership"*) to provide assistance to developing countries severely affected by climate change. As part of this mechanism, the "Grant Aid Program for Environment" was established as a new scheme of grant aid. Accordingly, the Japan International Cooperation Agency (JICA) conducted an urgent needs assessment survey[1] of equipment related to countermeasures for climate change and the water sector in Senegal, which was a participating country in *the Cool Earth Partnership*. Subsequently, in response to a request from the Senegalese Government, a preparatory survey on the emergency water supply was carried out. The results of the study confirmed the needs to procure equipment for climate change countermeasures. Therefore, this project was decided to be implemented.

1.2 Project Outline

The project aimed to strengthen the water supply capacity and therefore address climate change by renewing aging or broken EGP in deep well water supply facilities throughout 10

[1] Implemented from December 2008 to January 2009

target regions (Thiès, Louga, Saint Louis, Matam, Tambacounda, Kédougou, Kaffrine, Kaolack, Fatick, and Diourbel), and by deploying EMWF and EEW to the regional offices of the executing agency, thereby contributing to improvements of residents' sanitary environment.

Grant Limit / Actual Grant Amount	1,000 million yen / 1,000 million yen
Exchange of Notes Date /Grant Agreement Date	March 2009 / March 2009
Executing Agency	Office of Rural Boreholes (*Office des Forages Ruraux*, hereinafter referred to as "OFOR"), Ministry of Water and Sanitation[2]
Project Completion	June 2014
Target Area	EGP: 87 sites in 10 regions (Thiès, Louga, Saint Louis, Matam, Tambacounda, Kédougou, Kaffrine, Kaolack, Fatick, Diourbel) EMWF: Whole Senegal EEW: Whole Senegal
Main Consultant	Kokusai Kogyo Co., Ltd. (Soft component and additional study)
Procurement Agency	Japan International Cooperation System
Outline Design	April 2009 - May 2009
Related Projects	<Technical Cooperation Project> - Project on safe water and Support on community activities (PEPTAC1) (2003-2006) - Project on safe water and Support on community activities Phase 2 (PEPTAC 2) (2006-2010) <Grand Aid Project> - Project for rural water supply 1st phase -13th phase (1979-1998) - Project for water supply in rural areas (1992) - Project for reinforcement of rural water supply system (1994) - Project for drinking water supply in the region of Tambacounda (2010) - Project for drinking water supply and improvement of hygiene conditions in rural areas (2015)

2. Outline of the Evaluation Study

2.1 External Evaluator

Akiko Shimizu, Value Frontier Co., Ltd

[2] At the time of ex-ante evaluation, the executing agency was the Direction of Operations and Maintenance (*Diréction de l'Exploitation et de la Maintenance*, hereinafter referred to as the "DEM") and the lead agency was the Ministry of Urban Development, Housing, Water, and Sanitation. In 2012, the name of the lead agency was changed to the "Ministry of Water and Sanitation" following its reorganization. In 2014, after the establishment of the Office of Rural Boreholes (OFOR), the main functions for which the DEM had been responsible were transferred to the OFOR.

2.2 Duration of Evaluation Study

This ex-post evaluation study was conducted with the following schedule.

Duration of the Study: September 2019 - September 2020

Duration of the Field Study: December 15, 2019 - January 3, 2020

2.3 Constraints during the Evaluation Study

(1) Setting of Indicators

The project did not prepare an ex-ante project evaluation sheet and no clear indicators were established at the time of ex-ante evaluation. Therefore, considering the project objectives, the external evaluator herself set indicators for the project's effectiveness and impact by referring to the "Expected Effects of the Program" in the Preparatory Research Report (2009) regarding this project and the "Examples of Indicators by Development Issues (Water Resources)" (JICA).

(2) Indicator of Effectiveness

As part of the ex-post evaluation, the evaluator planned to obtain data on the "water supply population" in the target areas as an operational indicator, and planned to evaluate the quantitative effect of the effectiveness based on the rate of increase since the completion of the project. However, *the Millennium Program on Water and Sanitation* (*Programme d'Eau Potable et d'Assainissement du Millénaire*, hereinafter referred to as "PEPAM"), which collected the data related to the water supply, did not have enough reliable data to warrant publication[3]; thus, the indicator was dropped from the judgment criteria used to determine the project's effectiveness.

(3) Cancellation of the Second Field Survey

Due to the expansion of the Coronavirus Disease 2019 (COVID-19), the second field survey was cancelled, and some information was therefore collected through a local consultant under the remote supervision of the external evaluator.

3. Results of the Evaluation (Overall Rating: C[4])

3.1 Relevance (Rating: ③[5])

3.1.1 Consistency with the Development Plan of Senegal

At the time of ex-ante evaluation, the revised version (2006) of *the Poverty Reduction Strategy Paper* (hereinafter referred to as the "PRSP") (2002), which is Senegal's national

[3] According to PEPAM, data of rural areas were not collected in 2017 and 2018, and no official data are available for release due to shortfalls in rural data collected in 2019.

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

[5] ③: High, ②: Fair, ①: Low

development plan, and *the Millennium Development Goals* (MDGs), stated that "safe water supply" as a primary development issue in terms of health and poverty reduction, and set a target of increasing the water supply rate in rural areas to 82% by 2015. In addition, the PEPAM was formulated in 2005 as an administrative guideline for the water supply sector, and aimed to achieve the goals of the PRSP. The Senegalese water supply programs were implemented in line with the PEPAM, and this project was also implemented as part of the PEPAM project.

At the time of ex-post evaluation, improving access to water in rural areas was listed as a priority in the national development plan, *the Senegal Emergent plan 2014-2018* (*Le Plan Sénégal Emergent*, hereinafter referred to as "PSE"), which was developed in 2014. The revised PSE (2018) established the target of increasing the water supply rate in rural areas from 91% in 2017 to 100% by 2023. The policy for the water supply sector, *the Sectoral Development Policy Letter 2016-2025 (Lettre de politique Sectorielle de Developpement)* (formulated in 2016), established four goals, one of which aims to achieve universal access to water by 2025. Further, the PSE includes, as one strategy for improving the water supply, to strengthen the level of preparedness to respond to natural disasters caused by climate change and other factors.

In terms of enhancing the water supply's capacity to address climate change, the project was considered consistent with Senegal's development plans when both the ex-ante and ex-post evaluations were conducted.

3.1.2 Consistency with the Development Needs of Senegal

At the time of ex-ante evaluation, water shortages due to droughts and groundwater reduction were worsening due to dry climatic conditions and climate change. Consequently, the dependence on existing deep well water supply facilities had been increasing. According to the well aggregate data (2009) of the Direction of Operations and Maintenance (DEM), approximately 11%[6] of the deep well water supply facilities had ceased operations, mainly due to aging or frequent malfunctions in the EGP. In addition, many days were required to recover from the shutdown of deep well water supply facilities, which mainly occurred due to the shortage and malfunctions associated with the deterioration of EMWF, which was used to repair the EGP. Moreover, while the need for an emergency water supply implemented via water tankers was growing in rural areas, in which water supply facilities did not exist, there were frequent malfunctions due to the aging of such equipment and also there was a shortage of the water tankers themselves, which meant that the current number of functioning water tankers could not meet the demand of an emergency water supply. Under these circumstances, the water supply rate in rural areas was low (75.5% as of 2008) according to the PEPAM.

[6] 132 out of 1,211 water supply facilities with deep well in rural areas were out of operation.

At the time of ex-post evaluation, the well aggregate data (as of December 2019) of the OFOR indicated that approximately 3%[7] of the existing deep well water supply facilities were out of service. The main cause of the shutdowns was the same as that documented at the time of ex-ante evaluation, which was the aging or malfunction of EGP or EMWF; thus, the need to renew that equipment is still high. In addition, the demand for water tankers is still high in rural areas, where water supply facilities have been temporarily shut down due to malfunctions of EGP or where there is no water supply facility. Although the water supply rate in rural areas had improved dramatically (to 94.8% as of 2018)[8], further development of the water supply capacity is required on an ongoing basis to reach the development target of 100%.

Since the project's objective focuses on strengthening the water supply capacity by procuring the requisite equipment, it was deemed consistent with Senegal's development needs at the time of ex-ante and ex-post evaluations.

3.1.3 Consistency with Japan's ODA Policy

At the time of ex-ante evaluation, the *ODA Charter* (2003) identified "poverty reduction" as one of the four pillars and prioritized "water and sanitation." *The ODA Medium-Term Policy* (2005) also noted "poverty reduction" as another of the four priority issues, targeting the "expansion of basic social services, such as safe water." In addition, in *the Country Assistance Program for Senegal* (2009), which presented Japan's ODA policy, "water supply" was listed as a key target in Small-target II "Improvement of basic social services" under Medium-target I "Improvement of the lives of the poor in rural areas". Furthermore, as mentioned above, this project was implemented as part of the assistance provided by *the Cool Earth Partnership*, which was announced by the Japanese Government in 2008.

Since the project was designed to strengthen the water supply capacity and therefore address climate change, the project was consistent with Japan's aid policy at the time of ex-ante evaluation.

In light of the above, the project has been highly relevant to the Senegal's development plans and development needs, as well as Japan's ODA policies. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The project outputs comprise (1) equipment procurement and (2) technical assistance to strengthen the operational and maintenance capacities of the procured equipment (hereinafter referred to as "Soft Component"). Equipment procurement increased compared to the original

[7] 69 out of 1,980 water supply facilities with deep well in rural areas were out of operation.
[8] Source: PEPAM

plan due to the decision to spend the residuals, and the Soft Component was carried out largely as planned.

(1) Equipment Procurement

In addition to the planned procurement of equipment, the project procured one water tanker and five borehole cameras with the residuals that remained following a circumstance in which the bid price for a water tanker was lower than expected. Details are shown in Table 1.

Table 1. Planned and Actual Procurement Equipment

	Planned	Actual
A. Equipment for groundwater pumping (EGP)		
a) Underwater motor pump	68	68
b) Generator set	61	61
c) Vertical axis pump	12	12
d) Diesel motor	13	13
e) Accessory	A package	A package
B. Equipment for the maintenance of water supply facilities (EMWF)		
a) Crane truck	7	7
b) Pickup	11	11
c) Hoist crane	4	4
d) Air compressor	5	5
e) Welding device	5	5
f) GPS	9	9
C. Equipment for emergency water supply (EEW)		
a) Water tanker	36	36
D. Additional procured equipment		
a) Water tanker	—	1
b) Borehole camera	—	5

Sources: Materials provided by JICA and the executing agency

Meanwhile, due to project delays, some deep well water supply facilities in which EGP was scheduled to be installed had already been renovated by other donors, so alternative facilities were selected. The plan entailed installing either an underwater motor pump and a generator or a vertical axis pump and a diesel motor in certain facilities. However, only one piece of the equipment was recognized as needed in some alternative facilities. Accordingly, the project responded by increasing the number of alternative facilities to ensure the installation of all equipment procured. For this reason, while the total quantity of EGP remained the same as that outlined in the plan, the number of target water supply facilities increased from 82 to 87.

Table 2. Number of Targeted Water Supply Facilities in which EGP was Installed by Region

Region	Planned	Actual
Thiès	6	5
Louga	12	12
Saint Louis	6	8
Matam	8	8
Tambacounda	27	28
Kédougou	4	5
Kaffrine	6	9
Kaolack	4	3
Fatick	5	4
Diourbel	4	5
Total	82	87

Sources：Materials provided by JICA

(2) Soft Component

In Senegal, the operation and maintenance system was promoted and the resident-led Boreholes Users Association (Association des Usagers du Forage, hereinafter referred to as "ASUFOR") assumed a leadership role in maintaining the water supply facilities. At the time of ex-ante evaluation, the project was undergoing a period of transition to this new system. Accordingly, some sites were targeted by the project around which ASUFOR were not organized or had weak capacity. In the Soft Component, technical assistance was provided to strengthen the organization of ASUFOR to ensure the proper operation and maintenance of the EGP. In addition, technical assistance was provided to the DEM, which was the executing agency at the time of ex-ante evaluation, to ensure the effective use of EMWF. Four outputs were established in the implementation of the Soft Component, as shown in the table below, and were accomplished as planned.

Table 3: Planned and Actual Outputs of the Soft Component

Planned Outputs	Actual Outputs
Output 1: Preparation for water fee collection is regulated by organizing new ASUFOR and strengthening existing ASUFOL.	New ASUFOR were organized and existing ASUFOR were strengthened through awareness-raising activities for residents and training for ASUFOR, and almost all ASUFOL in targeted sites were prepared to collect water fees. (Although some remote sites had difficulty in managing bank accounts and coordinating with DEM, it was largely carried out as planned.)
Output 2: Water facilities are properly managed by ASUFOR operators.	The capacity of ASUFOR operators to properly manage their facilities was strengthened through training for operators.
Output 3: The equipment owned by the DEM is properly maintained and managed.	The capacity to properly maintain and manage the equipment owned by the DEM was strengthened through technical instructions on the method of equipment management for those in charge of equipment management at the DEM.
Output 4: The maintenance of the boreholes is properly conducted by the DEM.	The capacity of the DEM to properly conduct borehole maintenance was strengthened through technical instructions provided on maintenance equipment for DEM technicians.

Sources: Materials provided by JICA and executing agency

3.2.2 Project Inputs

3.2.2.1 Project Cost

The project was conducted as the Procurement Agent Scheme. The actual cost of Japan's contribution was 1,000 million yen, which was the same as the amount estimated at the time of ex-ante evaluation. Thus, Japan's expenditure was in alignment with that of the plan (100%). Senegal's contribution was set at 146 million yen at the time of ex-ante evaluation. While the actual cost could not be confirmed, the evaluation of the project cost was conducted considering only Japan's contribution.

Table 4: Planned and Actual Project Costs of Japanese Side's Contribution

(Unit: million yen)

Breakdown	Planned	Actual
Equipment	869	865
Procurement agency costs	61.5	61
Soft Component	69.5	74
Total	1,000	1,000

Sources: Materials provided by JICA

3.2.2.2 Project Period

At the time of ex-ante evaluation, the planned project period was 25 months, and began in March 2009 (the month of the Grant Agreement (hereinafter referred to as "G/A")) and was set to conclude in March 2011 (the month of the last equipment delivery), but the actual project period was 64 months, and began in March 2009 (the month of G/A) but continued until June 2014 (the month of the last equipment delivery), which significantly exceeded the plan (256% of the planned timeline). The main delays were due to the occurrence of the following three factors, none of which could have been anticipated in the planning stage, and which were appropriately addressed as necessary during the implementation of the project.

(1) Bid failures

EMWF and EGP each experienced two bid failures.

(2) Additional study for the selection of alternative sites

Owing to the fact that the installation of a pumping well was not possible due to the collapse of a deep well and also because some equipment had already been installed by other donors, it was necessary to find alternative facilities in which the procured EGP could be installed; thus, an additional study was carried out to select alternative sites.

(3) Termination of the contract with the equipment procurement company due to non-performance of the contract

In 2013, it was found that the equipment procurement company "Société Sénégalaise des

Etablissements AFCO," which had signed a contract in August 2010, had defaulted on the contract due to deterioration in the company's management. Therefore, the contract was terminated, and a new procurement company was selected. According to the OFOR, it was difficult to foresee the deterioration in the company's performance, as the management of AFCO was seemingly in good condition at the time of the bid.

Due to the delays mentioned above, the timing of the EGP's delivery varied widely across all sites, and occurred between July 2011 and June 2014.

Table 5. Year of EGP Delivery and Number of Sites by Region

Region	2011	2012	2013	2014	Total
Thiès	2	3	—	—	5
Louga	8	2	2	—	12
Saint Louis	5	—	1	2	8
Matam	2	1	2	3	8
Tambacounda	—	18	8	2	28
Kédougou	—	2	3	—	5
Kaffrine	—	—	9	—	9
Kaolack	—	—	2	1	3
Fatick	—	1	3	—	4
Diourbel	—	—	5	—	5
Total	17	27	35	8	87

Sources: Materials provided by JICA

In light of the above, although the project cost was as planned, the project period significantly exceeded the plan. Therefore, the efficiency of the project is fair.

3.3 Effectiveness and Impacts[9] (Rating: ③)

3.3.1 Effectiveness

As described in "2.3 (1) Setting of Indicators," since no indicators were set for this project at the time of ex-ante evaluation, the external evaluator established them at the time of ex-post evaluation. As such, a survey using questionnaires (hereinafter referred to as "Questionnaire Survey[10]") was conducted with 100 users of the deep well water supply facilities, in conjunction with a qualitative survey (hereinafter referred to as "Interview Survey[11]") with

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

[10] A total of 20 survey sites were selected among the 87 sites with renewed EGPs, considering the geographical accessibility and proportion of sites covered by the project in each province; Thiès (1 site), Louga (3 sites), Saint Louis (2 sites), Matam (2 sites), Tambacounda (6 sites), Kédougou (1 site), Kaffrine (2 sites), Kaolack (1 site), Fatick (1 site), and Diourbel (1 site). The target population of the survey was residents who had used the deep well water supply facilities since before the EGP was renewed. The ratio of the number of people surveyed in each region was calculated based on the ratio of the number of sites covered by the project in each region; Thiès (6), Louga (14), Saint Louis (9), Matam (9), Tambacounda (32), Kédougou (6), Kaffrine (10), Kaolack (3), Fatick (5), and Diourbel (6). The sample of 100 respondents included 59 males and 41 females. The average age of the respondents was 46 years old.

[11] The interview survey was conducted through group discussions with two to five stakeholders per site (ASUFOR

ASUFOR members, conductors, and users of water supply facilities to confirm the project's effectiveness and impacts, as described further below. In addition, as described previously in "2.3 (2) Indicator of Effectiveness," the operational indicator for the project's quantitative effects was dropped from the criteria used to evaluate project effectiveness.

3.3.1.1 Quantitative Effects (Effect Indicators)

The "water supply rates at sites with EGP" and the "operation rate of deep well water supply facilities" were set as effect indicators in this evaluation.

(1) Water Supply Rates at Sites with EGP

Since the PRSP had set the target of increasing the water supply rate in rural areas to 82% by 2015, the target value of this indicator was set to reflect that same value.

At the time of the project's completion (2016), the water supply rates exceeded 82% in all regions, and this indicator is therefore considered to have been achieved. As shown in Table 7, the national average of the water supply rate in rural areas has been increasing since 2016, therefore indicating that access to water in Senegal has been improving nationwide.

Table 6. Water Supply Rates[12] at Sites Where EGP was Renewed Under the Project

Region	Number of sites	Baseline	Actual			
		2009	2016	2017	2018	2019
			Completion Year	1 year after completion	2 years after completion	3 years after completion
Thiès	5	—	90.3%	—	—	—
Louga	12	—	84.2%	—	—	—
Saint Louis	8	—	92.7%	—	—	—
Matam	8	—	89.4%	—	—	—
Tambacounda	28	—	78.9%	—	—	—
Kédougou	5	—	93.4%	—	—	—
Kaffrine	9	—	92.2%	—	—	—
Kaolack	3	—	93.1%	—	—	—
Fatick	4	—	89.5%	—	—	—
Diourbel	5	—	92.1%	—	—	—

Source: PEPAM

Table 7. Water Supply Rate in Rural Areas (National Average)

2016	2017	2018	2019
89.5%	91.3%	94.8%	—

Source: PEPAM

(2) Operation Rate of Deep Well Water Supply Facilities in which EGP was Renewed

At the time of ex-ante evaluation, 19 of the 82 deep well water supply facilities in which

members, conductors, and users of water supply facilities) at 12 total sites.

[12] The water supply rate is calculated by dividing the total population by the population of the village where the water supply facility is in place.

EGP was scheduled to be renewed were out of service (76.8% of the operation rate). At the time of ex-post evaluation, the operation rate increased significantly, as only two out of the 87 facilities in which EGP was renewed were out of service (97.7% of the operation rate) (see Table 8). According to the questionnaire survey, 98 out of 100 facility users reported that they had experienced shutdowns of deep well water supply facilities before the project's implementation, whereas the number of facility users who experienced shutdowns in the deep well water supply facilities after EGP was renewed by the project decreased by approximately half the original number to 52. Many respondents commented that the shutdowns of the deep well water supply facilities were caused by malfunctions in the EGP[13]. This suggests that a reduction in the number of malfunctions of EGP improved the operational status of the deep well water supply facilities and contributed to a reliable water supply.

Table 8. Operation Rate of Deep Well Water Supply Facilities with Renewed EGP

Baseline	Actual			
2009	2016	2017	2018	2019
	Year of Completion	1 year after completion	2 years after completion	3 years after completion
76.8% 62／82 sites	—	—	—	97.7% 85／87 sites

Sources: Materials provided by JICA and the executing agency

However, at 38 out of 68 deep well water supply facilities, all or some of the procured EGP had already been replaced due to breakdowns caused by age or other reasons, which was confirmed through interviews with the OFOR and via observation by the external evaluator. Therefore, at the time of ex-post evaluation, it cannot be said that the "operation rate of the deep well water supply facilities" represents the effect of the project alone. Conversely, at the time of ex-post evaluation, five to eight years had passed since the EGP was procured, and considering the lifetime of the equipment (five years for underwater motor pumps, seven years for generators, seven years for vertical axial pumps, and five years for diesel motors), there is no question that some of the equipment had already been replaced. It is fair to say that certain effects were realized during the lifetime of the equipment.

3.3.1.2 Qualitative Effects

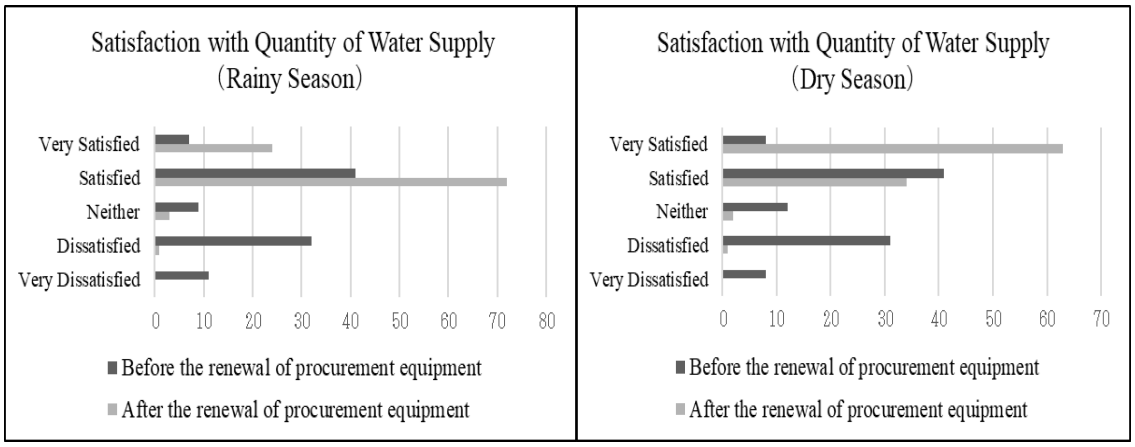
To confirm the enhancement of the water supply capacity and climate change countermeasures, the level of satisfaction (on a five-point scale[14]) with the quantity of the

[13] Before and after the project was implemented, respondents stated that the cause of shutdowns at deep well water supply facilities was due to malfunctions in EGP (91 out of 100 and 32 out of 52, respectively). Other causes of shutdowns after project implementations included leaking water pipes (9), insufficient water supply (4), and low batteries (1 out of 52).

[14] Five-point scale of "Very Satisfied", "Satisfied", "Neither satisfied nor dissatisfied", "Dissatisfied", and "Very Dissatisfied".

water supply (in rainy and dry seasons) was set as an indicator of qualitative effects.

The results of the questionnaire survey show that satisfaction with the quantity of the water supply during both the rainy and the dry seasons increased after EGP was renewed by the project. According to the interview survey, the pumping capacity of the renewed EGP remains the same as that of the pre-replacement equipment because both have equivalent specifications. However, a reduction in the malfunctions of EGP after its replacement has increased the operation rate of the deep well water supply facilities, thus allowing more water to be used throughout the year.



Sources: Results of the questionnaire survey

Figure 1. Level of Satisfaction with Quantity of Water Supply Before and After the Renewal of Procured Equipment (Rainy and Dry Seasons)

Furthermore, as Table 9 shows, the level of satisfaction during the dry season increased from 3.1 points (before the replacement) to 4.6 points (after the replacement), thus indicating a greater improvement in the level of satisfaction during the dry season than the rainy season[15]. In Senegal, partially due to dry climatic conditions and climate change, some rivers that flowed through the inland plateau dry up during the dry season. The reliable operation of the deep well water supply facilities throughout the year may enhance the level of satisfaction with the water supply, especially during the dry season.

Table 9. Average Satisfaction Level[16] with Water Quantity at Deep Well Water Supply Facilities

	Before the replacement of the procured equipment	After the replacement of the procured equipment
Rainy season	3.0	4.2
Dry season	3.1	4.6

Sources: Results of the questionnaire survey

[15] Rainy season: from June to October. Dry season: from November to May.
[16] The average was calculated based on 5 points for "Very satisfied", 4 points for "Satisfied", 3 points for "Neither satisfied nor dissatisfied", 2 points for "Dissatisfied", and 1 point for "Very dissatisfied".

3.3.2 Impacts

3.3.2.1 Intended Impacts

The project's impacts were examined through the following aspects: (1) reduction in the use of unsanitary water sources, such as shallow wells, (2) improvement in water quality at deep well water supply facilities, (3) reduction in the incidence of waterborne diseases, and (4) the mitigation of drought damage.

(1) Reduction in the Use of Unsanitary Water Sources, such as Shallow Wells

Before EGP was renewed by the project, 76% of facility users had used other water sources, such as shallow wells, for instances when the deep well water supply facilities were out of operation. However, at the time of ex-post evaluation, this number had decreased to 23%. Before the project's implementation in the village of Lambaneme in the Fatick region, where the interview survey was conducted, a deep well water supply facility had frequently been shut down for several days each time the EGP malfunctioned. Some users had used donkeys to transport water they had purchased from other deep well water supply facilities in a neighboring village, while others had no choice but to use water from a shallow well. However, since the EGP was renewed in 2012 as part of the project, only two minor malfunctions had occurred, thus suggesting that the deep well water supply facilities have become more reliable and the use of shallow wells and other non-sanitary water sources has decreased.

(2) Improvement in Water Quality at the Deep Well Water Supply Facilities

According to the questionnaire survey, over 70% of the facility users were satisfied with the water quality at the time of ex-post evaluation, while about 50% of the users stated that there was no change in the water quality. According to the interview survey, the water quality of the deep well water supply facilities had not significantly changed following the replacement of the EGP. This suggests that the procurement of the EGP might not be directly responsible for the improvement in water quality at deep well water supply facilities; instead, the reduction in unsanitary water sources, such as shallow wells, could have contributed to an improvement in the level of access to safe water.

(3) Reduction in the Incidence of Waterborne Diseases

According to the questionnaire survey, while six facility users had family members who had suffered from waterborne diseases before the project's implementation, three more instances of this type of illness occurred after the project's implementation. All three of the above-mentioned persons were identified as residents of the Kaoussara 14 village in the Tambacounda region, and the interview survey conducted there found that the deep well water

supply facility had completely stopped operating following a borehole problem [17] approximately three years after the EGP was procured in 2012[18]. During the period in which the procured EGP was utilized, few incidences of waterborne diseases had occurred, but since the facility had shut down three years after its installation by the project and until the new deep well water supply facility was constructed two months prior to the interview survey, residents had no choice but to drink the water from the shallow wells and therefore suffered from waterborne diseases. Except this specific case, no incidence of waterborne diseases was identified in the questionnaire survey, and therefore the incidence of waterborne diseases is considered to have decreased following the project's implementation.

(4) Mitigation of Drought Damage.

According to the interview survey, the watering of livestock and crops during the rainy season could be managed via the water from the shallow wells, but a water shortage had occurred due to a decrease in the amount of water in the wells during the dry season. Since the EGP was renewed by the project, the deep well water supply facilities have been operating consistently, therefore enabling reliable water use throughout the year. In the three villages[19] where the interview survey was conducted, water for livestock had not been sufficient during the dry season, and in some cases, livestock had been lost. However, since the deep well water supply facilities had begun operating more steadily, residents were able to care for more livestock without risking the loss of an important source of income. Therefore, the interview survey suggests that the stable operation of the deep well water supply facility has mitigated drought damage.

3.3.2.2 Other Positive and Negative Impacts

(1) Impacts on the Natural Environment

Through consultation with the DEM, which was the executing agency at the time of ex-ante evaluation, it was considered that the project would have little or no negative impact on the environment. At the time of ex-post evaluation, the OFOR reported that no negative impacts on the natural environment from the project were identified. This project focuses on replacing outdated EGP at existing deep well water supply facilities and procuring EEW and EMWF for government agencies; thus, it can be concluded that no negative impact on the natural environment has occurred.

[17] The borehole was out of the scope for the project and the problem was not caused by EGP provided by the project.
[18] In the village of Kaoussara 14, the AUFOR had already been dismantled following the introduction of the system of operation and maintenance overseen by a private company. According to the interview with former AUFOR members, the procured EGP was installed in a deep well water supply facility in another village after the borehole problem occurred.
[19] Baback village in the Diourbel region, and Lambaneme and Mbof Mbalème villages in the Fatick region.

(2) Other impacts

At the time of ex-post evaluation, EEW (water tankers) was used to supply water for drinking, cooking, and domestic water for people who had gathered and stayed in the village for religious events. These water tankers play a significant role in supplying water, as the village population increases by five to ten times its typical number during the event. Since religious events are important to the people of Senegal, the water tankers procured by the project have been an essential part of the residents' lives.

In addition, in the village of Pété Ouarack in the Louga region, after a generator was procured and replaced by the project, the village was able to gain access to electricity. Since that time, the generator has been used as a backup in the case of electricity outages. According to the facility users in this village, they used the water supply facilities without shutdowns even during power outages, and rarely use other water sources anymore.

Considering the above, in terms of project effectiveness the "water supply rate" achieved the target value. In addition, it can be confirmed that the replacement of the EGP has reduced the number of its malfunctions, therefore leading to an increase in the operation rate of deep well water supply facilities. In terms of impacts, the use of unsanitary water sources was reduced, and water supply facility operation rates increased, which resulted in improved access to safe water. It was also observed that the influence of droughts was mitigated due to a more stable water supply during both the dry and rainy seasons.

In summary, the implementation of the project has generally produced the desired effects as planned, and therefore the effectiveness and impact of the project is high.

3.4 Sustainability (Rating: ①)

3.4.1 Institutional / Organizational Aspect of Operation and Maintenance

3.4.1.1 Institutional Aspect

In Senegal, the establishment of ASUFOR was decreed in 1996, and at the time of ex-ante evaluation, a new system, in which ASUFOR were responsible for the operation and maintenance of deep well water supply facilities in rural areas, was being promoted nationwide[20]. The new system was planned for ASUFOR to sign a maintenance contract with the private sector, in line with the country's transition toward privatization. In the transition of the new system, the OFOR, the current executing agency, was established and the policy has been promoted to make a maintenance contract between the OFOR and private companies, who would oversee the operation and maintenance of the deep well water supply facilities.

[20] At the time of ex-ante evaluation, the system of operation and maintenance was designed such that the national geographic area would be divided into three zones, within each of which a contract between a private firm and ASUFOR was drawn up.

Some ASUFOR have been dismantled in areas where the new system for operation and maintenance overseen by the private companies has already been in place. The operation and maintenance system run by the private companies has been introduced one step at a time, and at the time of ex-post evaluation, the system was already in place in five regions. Throughout the five regions, there is considerable diversity, as some villages use the new system and others operate under the existing system (which is operated and maintained by ASUFOR)[21].

Table 10. Year and Month of Contracts with the Private Companies and Target Areas

Year and Month of Contract	Target Area
April 2018	Some areas in Thiès and Diourbel regions
August 2018	Some areas in Tambacounda regions
June 2019	Some areas in Kaffrine and Kaolack regions

Sources: Materials provided by the executing agency

In response to a number of incidents of long-term shutdowns at deep well water supply facilities in areas where the new system of operation and maintenance overseen by the private companies had been introduced, it was decided to review the privatization policy at the October 2019 ministerial meeting. At the time of ex-post evaluation, an assessment study on privatization was to be conducted with the support of the World Bank[22]. Although the private companies are seeking to expand their maintenance and management areas to ensure stable and profitable business operations, all other expected contracts with the private companies for the remaining areas are being postponed. Since two systems are now in place across the regions, regional disparity in water supply services has arisen as an issue. It is necessary to promptly redesign a unified system.

3.4.1.2 Organizational Aspect

(1) Operation and Maintenance of EMWF and EEW

The DEM, which was the executing agency at the time of ex-ante evaluation, has already been dismantled, while the OFOR, which was the executing agency at the time of ex-post evaluation, now bears the responsibility for the operation, maintenance, repair, and replacement of EMWF and EEW. Six employees are now assigned to the Operational Control and Property Management Division in the OFOR, which was responsible for managing the procured EMWF and EEW at the time of ex-post evaluation. According to the OFOR, it is insufficiently staffed to perform its duties. Although the OFOR has requested an increase in the number of staff from the Ministry of Water and Sanitation, a concrete plan for increasing the number of staff has not yet been indicated.

[21] At 17 of the 87 deep well water supply facilities in which EGP procured by the project were installed, a system of operation and maintenance overseen by the private companies has been introduced.

[22] At the time of ex-post evaluation, the assessment study was postponed due to the expansion of COVID-19.

In addition, the procured EMWF and EEW were allocated to the Maintenance Subdivisions (Subdivisions de Maintenance, hereinafter referred to as the "SM[23]") and the Well and Borehole Brigades (Brigades de Puits et Forages, hereinafter referred to as the "BPF[24]"), which were formerly regional offices under the jurisdiction of the DEM; however, since the OFOR does not have regional offices, the procured equipment is still located in the SM and the BPF. Since the disbandment of the DEM, the SM and the BPF have been placed under the Rural Hydraulic Directorate (*Direction de l' Hydraulique Rurale*, hereinafter referred to as "DHR") of the Ministry of Water and Sanitation. As such, the OFOR does not have the jurisdiction to direct and order the SM and the BPF, and an ambiguous chain of command exists. This ambiguous structure makes it difficult for the OFOR to monitor EMWF and EEW. Furthermore, while the SM and the BPF are responsible for the daily maintenance of EMWF and EEW, when malfunctions occur that cannot be repaired by the SM and the BPF, the SM and the BPF sometimes request the OFOR to repair the equipment, while others seek for support from DHR; thus, it is difficult to claim that there is a consolidated division of roles and a structure of operation and maintenance for EMWF and EEW.

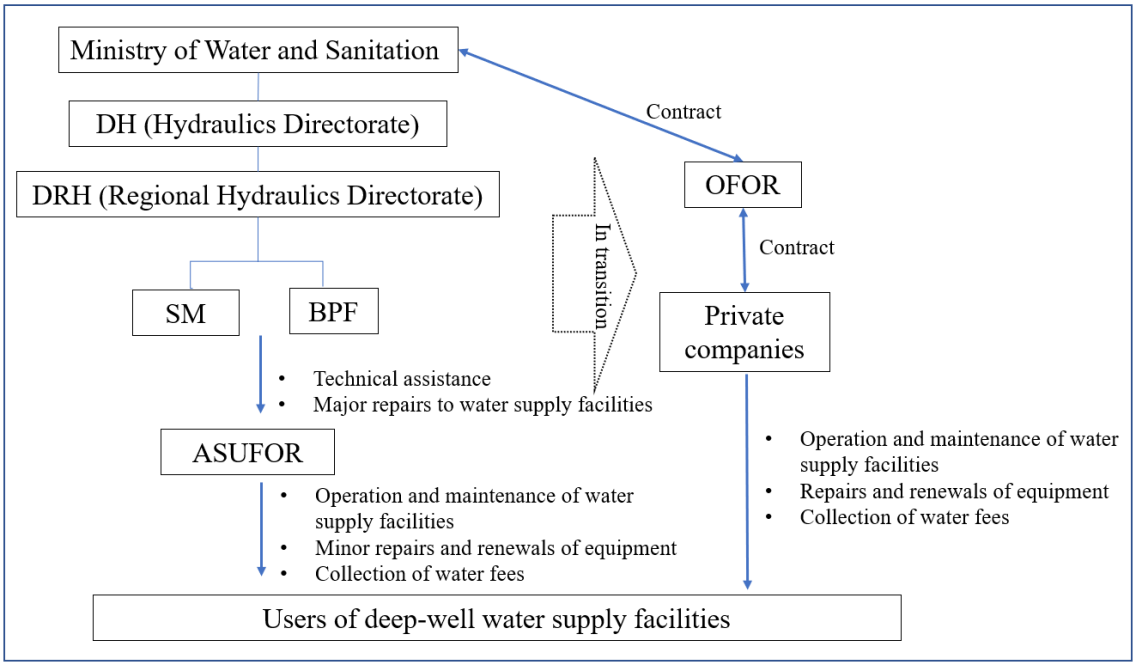
(2) Operation and Maintenance of EGP

In areas under the conventional system operated by ASUFOR, ASUFOR are responsible for the daily maintenance, repairs, and replacement of EGP. Daily maintenance and minor repairs are performed by an operator called a *Conducteur*[25], or a managing agent[26] called a *Gérant*, upon the request of ASUFOR. Replacements and major repairs of EGP are carried out utilizing EMWF operated by the SM or the BPF in each region and upon the request of ASUFOR. The SM or the BPF is staffed with one or two local government officials and a few contracted technicians, but since this staff is unable to respond to the repairs and monitoring of all deep well water supply facilities, they have somehow managed their duties with voluntary help from about five to ten technicians in each region. Whether the SM and the BPF will be dismantled after the completion of the transition to the operation and maintenance system operated by the private companies will depend on the results of the privatization assessment study that was decided to be conducted at the ministerial meeting.

In areas where the new system operated by the private companies was introduced, ASUFOR have already been dismantled and the private companies are now responsible for all maintenance services for EGP in deep well water supply facilities. According to the SM in the Kaffrine region, before the transition of the system to the private companies, minor

[23] The SM are located in the three regions of Louga, Kaolack, and Tambacounda.
[24] There are 17 BPFs across Senegal.
[25] Individuals who are paid by ASUFOR and perform the daily maintenance of deep well water supply facilities.
[26] Contractor who provides daily maintenance services for deep well water supply facilities, licensed by the OFOR and signed with ASUFOR.

malfunctions in EGP could be repaired within a day or two, but following the system's transition, cases have occurred in which over a week elapsed before repairs were completed, therefore leaving the facilities shut down[27]. Distressed residents sought support from the SM or the BPF, which had formerly provided technical assistance for the community's water supply, but it has become difficult for the SM and the BPF to respond to the problem because the issue is ultimately the responsibility of the private companies.



Source: Created by the external evaluator based on questionnaires and interviews with executing agency

Figure 2: System for Operation and Maintenance of EGP at the Time of Ex-post Evaluation

3.4.2 Technical Aspect of Operation and Maintenance

(1) EMWF and EEW

According to the SM and the BPF, any problems are not observed regarding the capacity of the technicians from the SM and the BPF in performing daily maintenance and minor repairs, but medium and large-scale repairs are difficult for them to address. In such cases, the SM and the BPF ask the OFOR to make the repairs or send them directly to a repair company. For cases in which the OFOR cannot respond to requests or the SM and the BPF cannot cover the cost of repairs, the equipment is left in disrepair for long periods.

(2) EGP

In areas under the conventional system operated by ASUFOR, major repairs of EGP in deep well water supply facilities, which cannot be handled by ASUFOR, are carried out by the

[27] The contract with the OFOR requires a response within 48 hours in the event of a deep well water facility shutdown.

SM and the BPF. According to the SM and the BPF, technicians (including volunteer technicians) can repair EGP with the skills they have gained through years of experience. The daily maintenance of EGP is carried out by the operators at ASUFOR's request. According to the interview survey, no particular problem with the capacity of the operators has observed. In addition, training for the operators has been provided by the BPF during the construction of new deep well water supply facilities and EGP replacements. Meanwhile, according to the OFOR, a number of ASUFOR experience challenging issues in terms of their organizational management due to an insufficient coordination among ASUFOR members, as well as issues stemming from a lack of clarity in the use of reserve funds, the capacity for fund management, and the ability to report on the operation and maintenance of deep well water supply facilities.

In areas the new system operated by the private companies was introduced, the training of staff charged with the operation and maintenance of the facilities was provided by the private companies upon the installation of new equipment. According to the SM and the BPF, some cases were observed that when the conventional EGP in deep well water supply facilities malfunctioned, the staff of the private company referred to technicians from the SM and the BPF as they were unfamiliar with the methods needed to repair conventional EGP. Other cases have been reported in which deep well water supply facilities have been shut down for days due to problems with EGP. Since the private companies have only recently started maintenance operations, they may not have developed the know-how for the smooth implementation of the maintenance required for the deep well water supply facilities.

3.4.3 Financial Aspect of Operation and Maintenance

(1) EMWF and EEW

When the OFOR was established, it was planned that it would operate water supply services using the revenue generated by commission fees collected from the private companies throughout the transition to privatization. However, the transition to the new system of operation and maintenance by the private companies has not fully progressed and commission fees collected from the private companies have not been sufficient to cover all expenses of OFOR. Therefore, state subsidies have covered the construction of water supply facilities, the procurement of equipment, and the maintenance and management of water supply facilities. The budget for the maintenance and enhancement of equipment managed by the OFOR has been on a downward trend since 2017. According to the OFOR, the budget for renewing aging equipment, as well as procuring scarce equipment, is insufficient. The OFOR may be required to accurately identify the quantity of equipment that is lacking or outdated in each region to secure the budget.

Table 11. OFOR Revenue from the Private Companies

(Unit: 1000 FCFA)

2017	2018	2019
81,715	104,080	163,474

Sources: Materials provided by the executing agency

Table12. OFOR Costs of Equipment Enhancement and Maintenance

(Unit: 1000 FCFA)

	2016	2017	2018	2019
Budget	5,667,979	7,209,256	5,522,697	4,997,556
Expense	3,300,388	5,474,182	4,630,496	3,221,487
Balance	2,367,591	1,735,074	892,201	1,776,069

Sources: Materials provided by the executing agency

The budgets for the SM and the BPF are allocated from DHR. According to the SM and the BPF, since the budget for repairing EMWF and EEW is very small, repairs are sometimes completed using the budget allocated for gasoline.

(2) EGP

In the areas under the conventional system operated by ASUFOR, the water fees are collected by ASUFOR. The collected fees are used for daily maintenance and are reserved in a fund for repairs or equipment purchases. The management status of ASUFOR's reserve fund varies, depending on their capacity. According to the SM and the BPF, it is desirable to reserve at least 1,000,000 FCFA in the fund; however, some ASUFOR have insufficient reserves, thus it may not be able to smoothly renew high-cost EGP, such as generators. As a result, the deep well water supply facilities have been shut down for a while, in some cases. According to interviews with members of ASUFOR which does not have sufficient reserves, they need to take out a loan from a bank when expensive equipment must be replaced.

In areas where the new system operated by the private companies has been introduced, the water fees are collected from facility users by the private companies, which are then used to cover the cost of operations and maintenance services. According to the private companies interviewed, most water fees are collected from residents without delay. If a household does not pay its water fees, that household’s taps may be turned off. Although the operation and maintenance of the EGP is covered by the water fees collected, they do not have sufficient financial resources to purchase EMWF and EEW, which raises concerns regarding the operation and maintenance of EGP at deep well water supply facilities in the future.

3.4.4 Status of Operation and Maintenance

3.4.4.1 Monitoring status of procured equipment

(1) Monitoring status of EMWF and EEW

The deployment and operational status of EMWF and EEW are not adequately aware by

the OFOR as monitoring was not conducted regularly. According to the OFOR, since the SM and the BPF are not under the OFOR's authority, it has struggled to have the SM and the BPF report the deployment and operational status of EMWF and EEW. In this ex-post evaluation, the external evaluator checked the present status with the help of the OFOR, and found that much of the procured equipment (33 out of 83) was out of service because it was broken down or already discarded due to its age or beyond its lifetime.

Table 13. Utilization Status of EMWF and EEW

	No. of procured equipment	No. of equipment utilized	No. of broken or discarded equipment	No. of equipment with unknown utilization status
EMWF				
Crane truck	7	3	4	0
Pickup	11	0	11	0
Hoist crane	4	3	1	0
Air compressor	5	0	5	0
Welding device	5	0	4	1
GPS	9	9	0	0
Borehole camera	5	2	3	0
EEW				
Water tanker	37	32	5	0
Total	83	49	33	1

Sources: Materials provided by the executing agency; questionnaires and interviews to the executing agency, SM and BPF

(2) Monitoring Status of EGP

In areas under the conventional system operated by ASUFOR, the SM and the BPF have still monitored the EGP by requiring ASUFOR to submit monthly reports to the BPF on the operational status of the deep well water supply facilities and the management status of the reserve fund. However, the SM and the BPF do not keep records or track which equipment was installed, in which facility, and when the installation occurred.

Table 14. Utilization Status of EGP procured by the Project

Among the 87 target facilities where the procured EGP was renewed			No. of facilities	Total
	Facilities where usage of EGP could not be verified		19	87
	Facilities where usage of EGP were verified		68	
		Facilities with all procured EGP in service	30	
		Facilities with only some of the procured EGP in service	9	
		Facilities with all EGP replaced with new equipment	29	

Sources: Materials provided by the executing agency, interviews with ASUFOR, or observation by the external evaluator.

In areas where the new system operated by the private companies has been introduced, the private companies are required to report to the OFOR regarding the operational status of

the deep well water supply facilities. The type and condition of the EGP installed at the deep well water supply facilities are specified in the maintenance agreements between the OFOR and the private companies, and a reporting mechanism is in place, therefore allowing the OFOR to monitor the operational status and replacement of the EGP.

3.4.4.2 Utilization Status of Procured Equipment

(1) Utilization Status of EMWF and EEW

The private companies do not own some of EMWF and EEW, such as crane trucks or air compressors, so they borrow them from the SM or the BPF when needed. In some regions, a private company pays a rental fee of 60,000 FCFA, in addition to the cost of gasoline, for each dispatchment of a water tanker and 120,000 FCFA (including gasoline) to the SM for each dispatchment of a crane truck, which is too expensive for a private company. In some cases, the private company is unable to rent a water truck and must rent a fire truck from the fire department to address the situation.

(2) Utilization Status of EGP

Some of the EGP procured as part of the project has already been replaced by other equipment, as the lifetime of the previous EGP expired. The other EGP that were procured as part of this project has still been in operation, but has been becoming outdated and its life span could end at any time. As previously mentioned, some ASUFOR have not secured a sufficient reserve fund to replace EGP, which raises concerns for the future.

In conclusion, some problems have been observed in the institutional, organizational, technical, and financial aspects, as well as the current status of this project's operation and maintenance. Therefore, the sustainability of the project effects is low.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

This project aimed to strengthen water supply capacity to address climate change by renewing the aging or broken EGP in deep well water supply facilities throughout 10 target regions, and also by deploying EMWF and EEW to the regional offices of the executing agency, thereby contributing to improvements of residents' sanitary environment. The project's implementation is highly consistent with Senegal's development plans and needs and Japan's ODA policies. Therefore, the relevance of the project is high. The project's implementation and its costs were largely implemented in line with the plan, however, the project period significantly exceeded that of the original plan. Thus, the efficiency of the project is fair. Regarding the project's effects, a significant improvement in water supply rates was confirmed.

In addition, the deep well water supply facilities have operated reliably throughout the rainy and dry seasons due to the replacement of old and frequently broken EGP. Some facilities had already received new equipment when the lifetime of the procured EGP expired. However, when the procured EGP was in operation, it played a significant role in strengthening the water supply capacity. Regarding the project's impacts, access to safe water has improved due to a decrease in the use of other water sources, such as shallow wells. Also, the incidence of waterborne diseases has been reduced. Moreover, cases have been confirmed in which the installation of drinking water drainage systems for livestock at deep well water supply facilities has eased water shortages for livestock, especially during the dry season; this has resulted in an increase in the number of livestock, which is an important source of income for residents. Therefore, the effectiveness and impacts of the project are high. In terms of sustainability, some problems were observed in institutional, organizational, technical, and financial aspects of the project. In addition, the procured equipment was not adequately monitored, which raises concerns regarding the current status of its operation and maintenance. Therefore, the sustainability of the project is low.

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

4.2 Recommendations

4.2.1 Recommendations to the Executing Agency

(1) Monitoring of EMWF and EEW

The EMWF and EEW procured by the project are located in the SM and the BPF, and the OFOR does not completely confirm or monitor its operational and maintenance status. By capturing information of EMWF and EEW (e.g., manufacturer, serial number, specifications, lifetime, years of use, and deployment status) and monitoring regularly its operational and maintenance status, the OFOR can perform a needs analysis to allocate equipment appropriately and identify any equipment that is lacking. To do so, it is recommended that the OFOR (with the support of DHR) establish a system to document the operational status of the EMWF and EEW via the SM and the BPF and to report this information to the OFOR, using the existing asset management manual (2017). For the time being, for example, it is suggested that the operational status of EMWF and EEW be confirmed using the existing reporting format, which is submitted to the OFOR every Monday in a report on the operational status of water supply facilities from the SM and the BPF.

(2) Monitoring of EGP

The BPF is responsible for monitoring the EGP procured under the project, but information regarding which equipment was installed and when the installation occurred at a given deep well water supply facility has not been sufficiently monitored. It is recommended

that information be collected regarding installed EGP, such as manufacturers, serial numbers, specifications, lifetime, and years of use, and stored in a database. In addition, it is desirable to establish a reporting system in which the SM or the BPF report to the OFOR regarding the status of equipment replacement. The management of the information regarding EGP is essential for the OFOR to promote the transition of the operations and maintenance system to the private companies in the future. The OFOR recognizes the need for the database and has begun compiling data regarding some of the equipment in areas where the new operation and maintenance system overseen by the private companies has already been introduced. However, since the information is not stored in a unified database, it is recommended that all information pertaining to the equipment be thoroughly managed to seize the opportunity created by the transition to the new system.

(3) Guidelines for Use of EMWF and EEW

As the private companies do not own some of EMWF and EEW, they rent the equipment, which is located in the SM and the BPF. Some of the SM and the BPF lend the equipment to the private companies free of charge, while the other SM and BPF charge a rental fee. Since no standardized regulation regarding the use of such equipment with private companies exists, it is recommended for the Ministry of Water and Sanitation to formulate, approve, and disseminate guidelines for sharing EMWF and EEW with private companies.

4.2.2 Recommendations to JICA

None

4.3 Lessons Learned

Establishment of a Monitoring System for Procured Equipment

At the time of ex-ante evaluation, as part of the obligations of recipient country, it was required to "establish a monitoring system for the status of utilization, and the operation and maintenance of the procured equipment." However, monitoring system has not been on place that the SM and the BPF, who use EMWF and EEW, have not recorded and reported the status of deployment and operation of the procured equipment to the OFOR. Accurately identifying the status of the procured equipment allows the necessary budget for maintaining or renewing the equipment to be secured. It is required to incorporate activities to support establishing or enhancing the monitoring system into the Soft Component when its needs are identified at the time of ex-ante evaluation, rather than expecting it as a matter of obligation for the recipient country.