

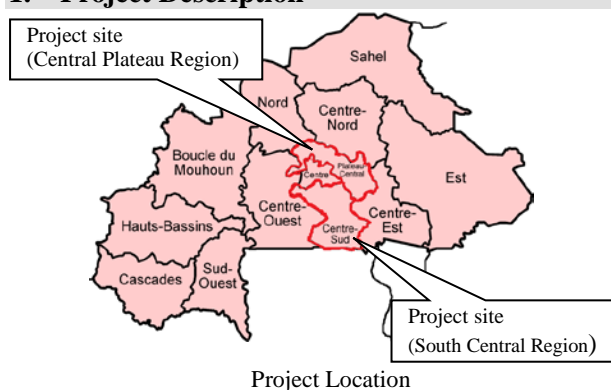
0. Summary

The project was implemented for the purpose of contributing to the improvement of the livelihood environment of the residents in the target areas in Burkina Faso, namely, three provinces in Central Plateau Region¹ and three provinces in South Central Region, through reliable access to safe drinking water by constructing deep wells with hand-pump facilities and developing the operation and maintenance system of the facilities.

The project was consistent with the development policies and development needs of Burkina Faso both at the time of project planning and ex-post evaluation. The Japan's ODA policy for Burkina Faso at the time of planning also matched the objective of the project. Therefore, its relevance is high. Although the project cost was within the plan, the project period became longer than planned. Therefore, the efficiency is fair. The target for the population supplied with water by the project that was set at the time of planning was achieved, and the operation rate of constructed deep wells with hand-pump facilities is high. In addition, the amount of water used by the users has increased, and water-borne diseases have been reduced by improving the water quality and the awareness of hygiene. It was also confirmed that women's working hours and children's school hours have been increased through the reduction of water fetching labor. Therefore, the effectiveness and impact of the project are high. There are some problems in the system and the financial condition of the operation and maintenance; thus, sustainability of the project effect is fair.

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

1. Project Description



Constructed Deep Well with Hand-pump Facility

¹ In this report, the term 'region' is used for 'région' in French. Burkina Faso's administrative divisions consist of regions, provinces, communes, and villages. There is a quartier as a lower settlement unit than village. It is a settlement that is basically made up of relatives and kin. In this report, the term 'rural society,' not 'village' is used in case of referring to a community society.

1.1 Background

The majority of the area of Burkina Faso consists of a savannah zone, which is a semi-arid area that suffers from chronic water shortage because annual rainfall is low between 500mm and 1,400mm. Average annual rainfall in the project target areas is 675mm in Central Plateau Region and 900mm in South Central Region². About 82% of the population live in rural areas³, and the residents used waters from the rivers and puddles for drinking. The people were in a poor hygienic environment because they could not ensure the supply of safe drinking water. Thus, the incidents of water-borne disease were high. In addition, women and children were forced to engage in severe labor of fetching water.

The Government of Japan considered the importance of cooperation in the water sector in Burkina Faso, and implemented a series of Grant Aid projects such as “Water Resources and Rural Facility Office Equipment Maintenance Project (1982)”, “Groundwater Supply Project (1992)”, and “Project for Clean Water Supply for the Eradication of Guinea-Worm (1998)”. These projects were intended to benefit the Burkina Faso people by providing support for ensuring the supply of safe water. The water supply rate of the target areas of the project, namely, Central Plateau and South Central Regions was relatively high out of the 13 regions in the country. However, the water supply rate for each rural area was varied, and there were many rural areas where sufficient water supply facilities were not in place for the population. Under such circumstances, the grant aid assistance for a drinking water supply project in Central Plateau and South Central Regions was requested to the Government of Japan by the Government of Burkina Faso in August 2005.

1.2 Project Outline

The objective of the project is to ensure reliable access to safe drinking water by constructing water supply facilities and developing the operation and maintenance system of the water supply facilities, thereby contributing to the improvement of livelihood environment of the residents in the target areas⁴; three provinces (Ganzourgou, Kourwéogo, Oubritenga) in Central Plateau Region and three provinces (Bazéga, Nahouri, Zoundwéogo) in South Central Region in Burkina Faso.

E/N Grant Limit or G/A Grant Amount / Actual Grant Amount	67 million yen / 64 million yen (Detailed Design) 1,459 million yen / 905 million yen (Project)
Exchange of Notes Date (/Grant Agreement Date)	February, 2009 (/ February, 2009) (Detailed Design) June, 2009 (/ June, 2009) (Project)

² JICA Implementation Review Study Report 2009

³ Burkina Faso has 351 communes in 45 provinces. The 351 communes are divided into 302 rural areas and 49 urban areas.

⁴ Central Plateau Region has three provinces, namely, Ganzourgou (8 communes), Kourwéogo (5 communes), and Oubritenga (7 communes) Provinces. South Central Region has three provinces, namely, Bazéga (7 communes), Nahouri (5 communes), and Zoundwéogo (7 communes) Provinces.

Implementing Agency ⁵	General Directorate of Drinking Water, Ministry of Water and Sanitation
Project Completion Date	August 2012
Main Contractor	Koken Boring Machine Co., Ltd.
Main Consultant	Japan Techno Co., Ltd.
Basic Design	March 2007 to January 2008
Implementation Review Study	July 2008 to January 2009
Detailed Design	February 2009 to February 2010
Related Projects	<p>Technical Cooperation Project</p> <ul style="list-style-type: none"> - Project for Enhancement of Water Supply Facilities Management and Hygiene and Sanitation in Rural Areas Phase II (2015-2018) - Project for Enhancement of Water Supply Infrastructure Management and Hygiene and Sanitation in the Region of Central Plateau (2009-2013) <p>Grant aid</p> <ul style="list-style-type: none"> - Project for Rural Water Supply in the Regions of Central Plateau and South Central Phase II (2012-2016) - Project for Clean Water Supply for the Eradication of Guinea-Worm (1998-2001)

2. Outline of the Evaluation Study

2.1 External Evaluator

Yasuo Sumita, Global Link Management, Inc.

2.2 Duration of Evaluation Study

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

Duration of the Study: October 2015 to February 2017

Duration of the Field Study: March 12 to April 1, 2016 and May 28 to June 4, 2016

3. Results of the Evaluation (Overall Rating: B⁶)

3.1 Relevance (Rating: ③⁷)

3.1.1 Relevance to the Development Plan of Burkina Faso

At the time of project planning, the Government of Burkina Faso set “ensuring access to basic social services for the poor” as the most important issue in the “Poverty Reduction Strategy Paper (Cadre Stratégique de Lutte contre la Pauvreté, developed in 2002 and revised in 2004) (CSLP)” to improve poor people’s access to safe drinking water. In addition, the government developed the “National Program for Water Supply and Sanitation by 2015 (Programme National d’Approvisionnement en Eau Potable et d’Assainissement à l’horizon 2015, PN-AEPA

⁵ Implementing agency of the project at the time of the Implementation Review Study (Jul. 2008 – Jan. 2009) was the General Directorate of Water Resources, Ministry of Agriculture, Hydrology and Water Resources. However, there were four times of reorganization of ministries and the General Directorate was restructured in May 2016, the General Directorate of Drinking Water, Ministry of Water and Sanitation became the implementing agency.

⁶ A: Highly satisfactory, B: Satisfactory, C: Partially satisfactory, D: Unsatisfactory

⁷ ③: High, ②: Fair, ①: Low

2015)” in 2006 to conform to the CSLP. In this program, the target was set to improve the water access rate⁸ of rural areas from 60% (2005) to 80% (2015)⁹. In order to achieve the target, it was estimated that construction of simple water supply facilities at 519 locations and 10,745 hand-pump facilities would be necessary.

National development policy at the time of ex-post evaluation is a “Strategy for Growth and Sustainable Development (Stratégie de Croissance Accélérée et de Développement Durable, SCADD)” which was formulated in 2010. In this policy, “water and sanitation” are stated as priority areas. In addition, “National Program for Water Supply by 2030 (Programme National d’Approvisionnement en Eau Potable à l’Horizon 2030, PN-AEP 2030)”, which sets the target to achieve 100% access to safe drinking water in rural areas was formulated in 2015 as the strategy of water supply and sanitation sector.

As seen above, the project aiming to improve reliable access to safe drinking water is consistent with the national development policies of Burkina Faso from the project planning stage to the ex-post evaluation.

3.1.2 Relevance to the Development Needs of Burkina Faso

Many people in the rural areas of Burkina Faso had poor access to hygienic drinking water and they depended on unhygienic water such as surface water of rivers and shallow wells. Thus, occurrence of water-borne diseases had been a problem at the time of project planning. Also, women and children were forced to engage in severe labor of fetching water for long hours every day. This situation needed to be improved. According to the “PN-AEPA 2015”, for the project target areas of Central Plateau and South Central Regions, 1,000 new hand-pump water supply facilities (Central Plateau: 607 facilities, South Central: 393 facilities) and 47 locations of simple water supply facilities (Central Plateau: 26 locations, South Central: 21 locations) were necessary. In 2009, before the project started, the access rate to safe drinking water in rural areas was 69.9% in Central Plateau Region and 70.9% in South Central Region¹⁰.

The access rate to safe drinking water at the time of ex-post evaluation (2015) in the project target areas was 79.4% in Central Plateau Region and 82.9% in South Central Region¹¹. Both regions showed improvement compared with before the project implementation, and the access rate exceeded the 76% that was the national goal set for access to safe drinking water in rural areas in the “PN-AEPA 2015”. However, newly established PN-AEP 2030 aims to improve the access rate to safe drinking water in rural areas to 100% by 2030. Therefore, there is a need to

⁸ Water access rate is the percentage of population that can ensure 20 liters of water per capita per day within 1 km or within a round trip of 30 minutes. (WHO: Guidelines for Drinking-water Quality, Fourth Edition, p. 84, 2011)

⁹ At the time of development of PN-AEPA, it had been planned that the water access rate will be improved from 60% to 80%, however, it was modified after 2009 from 52% to 72% by a review of access rates on the basis of the most recent demographic data reflecting the census data of 2006.

¹⁰ PN-AEPA 2015 RAPPORT BILAN ANNUEL, Février 2016

¹¹ PN-AEPA 2015 RAPPORT BILAN ANNUEL, Février 2016

keep improving access to safe drinking water in the target areas of the project.

In light of the above, the needs to improve access to safe drinking water in the target areas of the project are high both at times of project planning and ex-post evaluation.

3.1.3 Relevance to Japan’s ODA Policy

Basic policies and priority areas of ODA to Burkina Faso at the time of project planning was “to focus on basic human needs cooperation centered around education, water and health sectors which directly contribute to the improvement of people’s life, and food aid/assistance for underprivileged farmers in view of extreme poverty in Burkina Faso”¹². In addition, “access to social services” was stated as an assistance priority area, and “water and sanitation environmental improvement program” was listed as the cooperation program in the “Rolling Plan for Burkina Faso” (April 2009). Therefore, the project was consistent with the Japanese assistance policy.

In the light of the above, the project has been relevant to the development policies and development needs of Burkina Faso at times of project planning and ex-post evaluation as well as Japan’s ODA policy at the time of project planning. Therefore, its relevance is high.

3.2 Efficiency (Rating: ②)

3.2.1 Project Outputs

The 299 deep wells with hand-pump facilities were constructed out of the target value of 300. Of the 299 facilities, 295 were new deep wells with hand-pump and four hand-pumps were installed on existing deep wells. Although it was planned to install five hand-pumps on the existing deep wells, the Burkina Faso side constructed Level II water supply facilities¹³ at one of the five wells on their own. Thus, the total number of existing deep wells on which hand-pumps were installed became four instead of five.

Table 1 Planned and Actual Contents of Facility Construction Unit: Facility

Facilities content		Planned	Actual
Construction of deep wells with hand-pump facilities	Newly constructed deep wells	295	295
	Hand-pump installation and construction of peripheral facilities at the existing deep wells	5	4
Total		300	299

Note: In the project, hand-pump pedestal, well enclosure, drainage for drinking water of livestock, and seepage pits were included in hand-pump peripheral facilities.

Source: JICA Implementation Review Study Report and Documents provided by JICA

¹² Japan’s ODA Data by Country, Ministry of Foreign Affairs of Japan (2008)

¹³ Level II water supply facility is a pipe water supply facility to use a communal water faucet. Level I water supply facility refers to a deep well with hand-pump facilities constructed in the project.

All the activities for the project's capacity building (hereinafter referred to as "soft component") programs, activities 1 to 10 in Table 2 were conducted as planned. The activities 1 to 5 were carried out before the construction of wells. The 388 sites included 300 sites where facility construction had been planned and 88 sites that would be alternative sites in case of problems in terms of water quantity or water quality during well construction. The activities 6 to 10 were supposed to be carried out after construction to ensure successful wells, and were implemented for the Water Facility Site Committees (Comité de Point d'Eau, hereinafter referred to as the "CPE") of the total of 299 sites and for the repairers (Artisan Réparateur, hereinafter referred to as the "AR").

Table 2 Soft Component Program

1	Project description in communes at the start of the project and workshop preparation
2	Manual preparation (CPE training manual, hygiene guidance manual)
3	Workshop at communes
4	Raising the awareness of residents
5	Establishment of CPEs and conclusion of terms
6	Hygiene education
7	Accounting training
8	Training for ARs
9	Technical guidance relating to the operation and maintenance of facilities
10	Monitoring of CPE's management / follow-up

Source: Document provided by JICA

Table 3 Target Sites for Implementation of Soft Components

Region	Province	Target Commune	Target Sites	Facility Completed Sites
Central Plateau	Ganzourgou	8	92	79
	Kourwéogo	5	37	27
	Oubritenga	7	46	22
South Central	Bazéga	7	80	65
	Nahouri	5	77	61
	Zoundwéogo	7	56	45
Total	6 Provinces	39	388	299

Source: Document provided by JICA

The following were envisaged as items borne by the Burkina Faso side relating to outputs; 1) securing of land and land leveling, 2) maintenance and repair of the access road, 3) securing and leveling of the construction base, 4) securing of space such as a garage and yard, 5) providing materials and information, 6) effective management of procured materials and equipment and constructed facilities, and 7) other expenses (such as tariffs). These were carried out without problems.

3.2.2 Project Inputs

3.2.2.1 Project Cost

The total project cost for the Japanese side was planned to be 1,526 million yen including both detailed design and construction costs. The actual cost was within the plan, which was 969 million yen, 64% against the plan. According to the interviews with the project consultant, the main reasons why the project cost became lower than planned were 1) affect from foreign exchange, and 2) competitive bidding of construction costs. For 1), although the exchange rate at the time of planning (EN/GA amount) was 162.06 yen per euro, the rate applied at the time of the detailed design was 142.18 yen per euro; and at the time of construction, it was 137.69 yen per euro due to stronger yen. The construction cost was 62%, which is significantly lower than the planned value by competition between the bid participating companies and also due to the impact of foreign exchange.

Table 4 Project Cost (Japanese Side)

	Plan (G/A)	Actual	Ratio to the plan
Total	1,526 million yen	969 million yen	64%
Detailed Design	67 million yen	64 million yen	96%
Project	1,459 million yen	905 million yen	62%
(Construction cost)	-	720 million yen	-
(Equipment cost)	-	0 yen	-
(Design and administrative cost)	-	184 million yen	-

Source: Document provided by JICA

The project cost borne by the Burkina Faso side is unknown, however, 1) counterpart personnel expenses, 2) fuel and maintenance costs of the vehicle for the counterpart, 3) activity expenses for the establishment of maintenance and management system to promote the new system called the REFORME (Réforme du système de gestion des infrastructures hydrauliques d'approvisionnement en eau potable en milieu rural et semi urbain) (for details, refer to 3.5.1 Institutional Aspects of Operation and Maintenance), 4) costs of water quality monitoring implemented twice a year for deep wells after construction, 5) office consumables costs, 6) notification fee of the Authorization to Pay, 7) bank commissions, were carried out as planned.

3.2.2.2 Project Period

The project period was scheduled for 38 months¹⁴ from February 2009 to March 2012 including detailed design. The actual project period was 41.8 months from February 2009 to

¹⁴ Ex-ante Evaluation Sheet was not created, but the project period was considered to be a 38-month period based on the process table in the "JICA Implementation Review Study 2009". The period begins from February 2009, the starting point of the detailed design to March 2012, completion of the soft component program.

August 2012, 110% of the original plan. The reason why the project period exceeded the plan was delays in the construction and soft component implementation associated with it. In the background of the construction delay, an evacuation advisory was issued to the Japanese by the Ministry of Foreign Affairs of Japan, because of the security deterioration due to political unrest (issued on April 29, 2011 and released on June 3, 2011). In addition, even before the evacuation advisory, a curfew instruction during the day had been issued to the Japanese and affected the construction schedule. It was the rainy season when evacuation advisory was released, so there was a problem in work resumption, and the construction and pump installation work was behind schedule. The implementation of the associated soft component activities was also delayed. However, even excluding the evacuation period, the project period would be 40.7 months, 107% of the plan.

From the above, although the project cost was within the plan, the project period was longer than planned. Therefore, efficiency of the project is fair.

3.3 Effectiveness¹⁵ (Rating: ③)

3.3.1 Quantitative Effects (Operation and Effect Indicator)

The “water supplied population” had been set as a quantitative effect indicator of the project at the time of planning. In addition to this index, in order to check the operating status of the construction facilities in the project, it was decided to add as an indicator, the “operation rate of the water supply facilities,” and both indicators were confirmed.

3.3.1.1 Population Supplied with Water

The goal of the project was to increase the population supplied with water by 90,000 at the time of facility completion. Changes in population supplied with water and completion year of each term¹⁶ for the project are as shown in Tables 5 and 6. The baseline at the time of the feasibility study was 782,206 people based on the figure in 2007, and the target value was set at 872,206 people, an increase of 90,000 people from the baseline. However, after having checked the baseline against PN-AEPA 2015, this was the figure for 2005. Consequently, the population supplied with water in 2009 was used as the baseline for the ex-post evaluation because the completion of the first term of the project was 2010. Since the population supplied with water in 2009 in the rural areas in the target regions was 871,940, 961,940 people was set as the target value after adding 90,000 people to the population supplied with water in 2009. The actual population supplied with water in 2012 was 1,051,343 and when disregarding 31,500 people who are beneficiaries of the African Development Bank (AfDB) project implemented over the

¹⁵ Sub-rating for Effectiveness is determined in consideration of Impact.

¹⁶ The project was carried out in three terms to take into account the period when construction was interrupted due to the rainy season in Burkina Faso and Japanese fiscal year.

same period to increase the water supplied population in South Central Region, it is still 1,019,843 (actual value), exceeding the target by 6%¹⁷. It should be noted that the standard number of users per facility is 300¹⁸ in Burkina Faso. It was confirmed that a water facility was utilized by 300 people or more by site survey and interviews in Burkina Faso, thus, an increase of 90,000 people or more served by the 299 water facilities of the project was confirmed.

Table 5 Number of Facilities Completed by the Project Unit: Facility

Completion	1 st Term	2 nd Term	3 rd Term
	May-Jun. 2010	Mar.-Apr. 2011	Mar.-Jun. 2012
Central Plateau	66	62	0
South Central	0	71	100
Total	66	133	100

Source: Document provided by JICA

Table 6 Transition of Population Supplied with Water Unit: Person

Name of Indicators	Baseline	Target	Actual	Actual	Actual	Actual	Actual	Actual	
	2009	2012	2010	2011	2012	2013	2014	2015	
	Baseline Year	Project Completion			Project Completion	1 year after the Project Completion	2 years after the Project Completion	3 years after the Project Completion	
			1st Term Completion	2nd Term Completion	3rd Term Completion				
Water Supplied Population	Central Plateau	442,448	Not set	454,804	478,357	523,532	537,103	549,490	561,899
	South Central	429,492	Not set	449,050	477,619	527,811	556,717	575,957	608,332
	Total-①	871,940	961,940	903,854	956,156	1,051,343	1,093,820	1,125,447	1,170,231
	Water supplied by AfDB -② ¹⁹	—	—	—	—	31,500	—	—	—
	①-②	—	—	—	—	1,019,843	—	—	—

Source: Answers for the questionnaire and interviews of the Implementing Agency

3.3.1.2 Water Supply Facility Operation Rate²⁰

The operation rate of 299 deep wells with hand-pump facilities constructed in the project is 98.3%. The operation status in each region is shown in Table 7.

¹⁷ The population supplied with water served by a small number of water supply facilities constructed by village or quartier themselves and with assistance provided by NGOs was unknown.

¹⁸ According to the water supply facility design criteria of the “PN-AEPA 2015,” deep well with hand-pump facilities should target 300 people per facility, the distance of the facility should be within 1 km from the village center, and the water supply unit should be 20 liters per person per day. In addition, it is mentioned that water facilities have been constructed at a quartier level rather than a village level.

¹⁹ The target region of the project that overlaps with that covered by the assistance by AfDB is South Central Region in 2012 only.

²⁰ According to the definition of operation of a water facility by Burkina Faso, the pumping amount should be 0.7m³ per hour, and continuous non-working period should not be 12 months or more. Water quality testing was not carried out at the time of operation confirmation. With regard to water quality, the water quality guideline in line with WHO was applied and confirmed at the time of facility construction. It should be noted that the operation rate is the proportion of the sites in operation against the total number of facilities.

Table 7 Operational Status of the Deep Wells with Hand-pump Facilities Constructed by the Project (2015)

Region	No. of sites	No. of wells in operation	No. of wells out of operation	Operation rate
Central Plateau	128 (including 4 existing wells)	124	4	96.9%
South Central	171	170	1	99.4%
Total	299	294	5	98.3%

Source: Water Supply Sanitation Department, Regional Offices of Central Plateau and South Central

The operational status of the entire deep wells with hand-pump facilities in the two target regions of the project (also including facilities which were not constructed in the project) is as shown in Table 8. The operation rates of both regions were higher than 90%.

Table 8 Operational Status of the Entire Deep Wells with Hand-pump Facilities in the Two Target Regions (2015)

Region	No. of sites	No. of wells in operation	No. of wells out of operation	Operation rate
Central Plateau	3,968	3,615	353	91.1%
South Central	3,522	3,272	250	92.9%
Total	7,490	6,887	603	91.9%

Source: Water Supply Sanitation Department, Regional Offices of Central Plateau and South Central

Among the 299 deep wells with hand-pump facilities constructed in the project, site visits were conducted for a total of 92 facilities (30.8% of the total). There was a facility out of operation due to drought, but the total operation rate was 99% according to the pump check during the site survey and interviews with water users at the time of survey. The numbers of target sites chosen for the site survey were proportional to the numbers of constructed facilities in the project in the two regions as shown in Table 9.

Table 9 Number of Actually Visited Facilities

Region	Province	No. of Facilities	No. of Actually Visited Facilities	
Central Plateau	Ganzourgou	27	128 (43%)	13
	Kourwéogo	22		12
	Oubritenga	79		14
South Central	Bazéga	65	171 (57%)	14
	Nahouri	45		19
	Zoundwéogo	61		20
Total	6 provinces	299 (100%)	92 (100%)	

Source: Prepared by the external evaluator based on the site survey

Operation rate of deep wells with hand-pump facilities constructed in the project was 98.3%

(Table 7), which was higher than 91.9%, the operation rate of the entire deep wells with hand-pump facilities in the two target regions. Factors that enabled high operation rates are 1) selection of the appropriate management entity for facilities (deep wells), 2) selection of appropriate implementation sites, 3) establishment of spare parts supply system and organization of repairers²¹, and 4) facility design and selection of equipment.

1) Selection of appropriate management entity for facilities (deep wells)

In accordance with “PN-AEPA2015” which was formulated in 2006, water users’ associations (Association des Usagers de l’Eau, hereafter referred to as “AUE”) were established, and maintenance was switched away from the previous system of maintenance based on well units by CPEs, to a revised system of maintenance of all the wells within a village called REFORME. (The REFORME was a new system introduced by “PN-AEPA2015”. For details refer to 3.5.1 Institutional Aspects of Operation and Maintenance.) However, this revised system was not applied in the soft components, and for maintenance of each individual water supply facility constructed in the project, establishment and organization of a CPE on single well units was supported as in the previous system. As a result, ownership of the facilities by the users was cultivated, such as maintenance and hygiene management by the CPE, which greatly contributed to maintenance of the facilities.

2) Selection of appropriate implementation sites

From among the sites requested by the Burkina Faso side, the sites for construction were selected by scoring points for water supply rate, whether or not there was a good alternative source of water, the willingness of the residents to pay a water usage fee, the status of health and hygiene, the hydrogeological conditions, the capacity of the residents for maintenance, the impact on the construction process²², etc. In this way, sites for implementation were selected that were sustainable from the maintenance point of view and with a likelihood of high operation rate.

3) Establishment of spare parts supply system and organizing repairers

There is at least one spare parts dealer for the installed pump models used by the project in each province of the two target regions. There are four dealers in Central Plateau Region and four other in South Central Region. In addition, in three provinces in Central Plateau Region, repairer union of each province that had been organized by a related project, “Project for Enhancement of Water Supply Infrastructure Management and Hygiene and Sanitation in the Region of Central Plateau” became the spare parts sales base. This system enables rapid spare parts supply. This repairer union has become a system that can quickly dispatch ARs if pump repair is necessary, and repair

²¹ ARs who are licensed following a review by the regional office of the ministry are repairers (*maintenanciers*).

²² Easy access to the villages for large vehicles and excavation machinery.

system has been improved by sharing information on the spare parts supply through the union.

4) Facility design and selection of equipment

Designs of deep wells with hand-pump facilities in Burkina Faso are diverse, and a standard model is not defined. In the project, hand-pump pedestal, well enclosure, drainage for drinking water of livestock, and seepage pits were included in hand-pump peripheral facilities. According to interviews with residents, it became possible to maintain a good hygienic environment of the facilities and to supply drinking water to livestock conveniently because peripheral facilities were procured in the project in addition to hand-pumps. It was confirmed that the added value of these facilities further increased ownership by the users. In addition, the model of hand-pump was DIAFA made in Burkina Faso. DIAFA is very familiar to ARs because this brand has been supplied in Burkina Faso for 20 years or more. Maintenance training sessions for ARs by Diafa Inc. which is a manufacturing dealer of DIAFA were also incorporated as a part of soft component activities in the project. Furthermore, steel pipes which were generally used for lifting pipes in Burkina Faso were a cause for failure due to frequent corrosion. Therefore, PVC²³/stainless steel conjugation tubes with excellent durability were used for the lifting pipes. This facility design and equipment selection contributed to the operation and maintenance, thereby enabling the high operation rates.



Spilled water from the pump flows to livestock watering hole through drainage



Gravel around the well to avoid a mud puddle and scouring, and hedge to avoid livestock animals (developed by the residents)

3.3.2 Qualitative Effects

3.3.2.1 Situation of Water Quality

According to the site survey, the water is being used as drinking water in all of the sites in operation. Abnormalities and problems relating to water quality were not reported. According to the beneficiary survey²⁴ which asked about turbidity, smell, and taste, 98% and more of the

²³ PVC: Polyvinyl Chloride

²⁴ The beneficiary survey was conducted from April 6 to 10, 2016 in Central Plateau and South Central Regions

respondents gave the answer that these characteristics had been improved compared with before the project implementation. It should be noted that 65% of respondents were using shallow wells as their water source before the project.

3.3.2.2 Reliable Water Supply

In the results of the site survey, shortage of pumping water was not reported and the amount of water required by water users was supplied. Although the site survey was conducted during the dry season when demand for water generally increases, the situation of water supply was good. Thus, it can be assumed that a reliable amount of water is supplied throughout the year. In addition, in the beneficiary survey, 75% and more of the respondents answered that “there was no water stoppage” when asked about frequency of water supply suspension after the project.

3.3.2.3 Changes Relating to Water Fetching

In the interviews with the water users conducted during the field survey, several positive answers were reported including “it has become easier since the water facility is closer than before” (distance shortened) and “compared with pond water, water fetching has become easier” (reduction of water fetching labor). In addition, 80% of the water users answered that “the time required to fetch water has decreased” in the beneficiary survey.

Table 10 Water Fetching Labour (Distance/Time)

	Shortened		Not shortened	
	Men	Women	Men	Women
Water fetching distance	94	144	4	7
	238 (95.6%)		11 (4.4%)	
Water fetching time	81	119	17	32
	200 (80.3%)		49 (19.7%)	

Source: Beneficiary survey of water users

3.3.2.4 Support for Women’s Participation

The project consultant promoted participation of women in the soft component activities.

taking into account the ratio of facilities constructed in the project. A total of 10 sites (4 sites in Central Plateau Region, 6 sites in South Central Region) was sampled, and investigators carried out individual interviews with the water users (those who came to fetch water to the target site) and CPE members. The number of responses was 20 to 30 people per site with respect to water users, and the number of valid responses was 249 in total. In regard to CPE members, the number of responses from each site was 2 people and the number of valid responses was 20 in total. For water users, the age of respondents were as follows: 10s 9.2%, 20s 29.3%, 30s 23.3%, 40s 15.7%, 50s 14.5%, 60s 6.8%, 70s and older 1.2%. The respondents’ gender was men 39.8% and women 60.2%. For CPE members, the ages of respondents were as follows: 20s 5%, 30s 30%, 40s 45%, 50s 15%, 60s 15%. The respondents’ gender was men 85.0% and women 15.0%.

Specifically, measures were taken to increase the participation of women, such as encouraging the participation of women in each type of training, the appointment of women was actively recommended through the explanation meetings regarding the methods of selecting CPE members, the male-to-female ratios among the total resident participants were checked and discussed, the expression of women's opinions was encouraged in the awareness raising activities in the village, etc. However, it should be noted that male-to-female ratio of CPE members was not determined according to the project consultant and the implementing agency of the Burkina Faso side. The project consultant reported that, while a greater number of women takes charge of positions related with hygiene, men were more likely to be selected for positions that require reading and writing skills because the literacy rate of women tended to be lower than men (men 36.7%, women 21.0% in 2006)²⁵. The male-to-female ratio of CPE members was 7 : 3 according to the result of a beneficiary survey, and women had entered as members in all of the CPEs.

3.4 Impacts

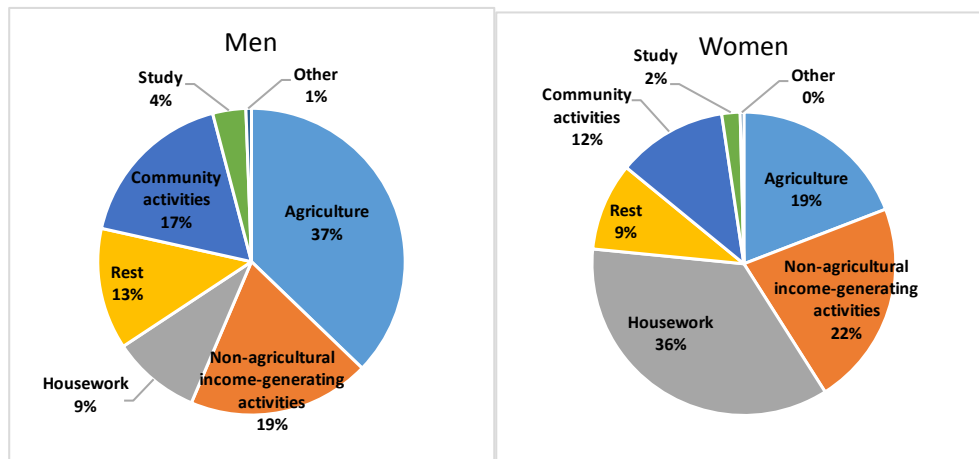
3.4.1 Intended Impacts

At the time of project planning, there was no indicator set to measure quantitative effects of the project impact. The following qualitative effects were postulated: 1) increase in school hours and working hours due to the reduction of water fetching labor, 2) reduction of water-borne diseases by safe water supply, and 3) dissemination of hygienic knowledge. At the time of ex-post evaluation, the following impacts have been confirmed.

3.4.1.1 Increase in Working Hours and School Hours Due to the Reduction of Water Fetching Labor

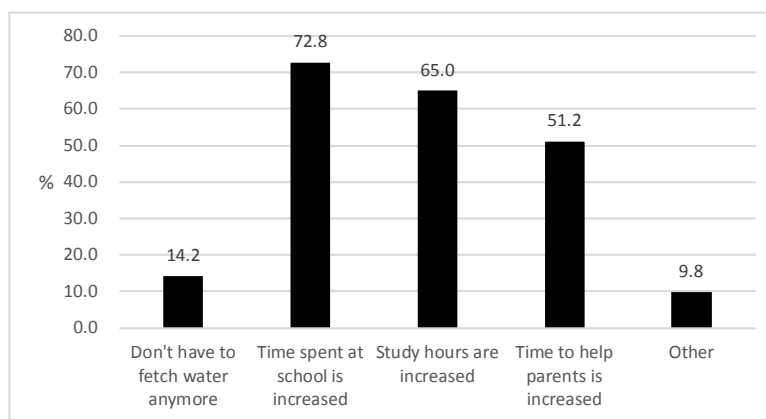
Men mainly used the time obtained by the shortened water fetching time for "agriculture" and "non-agricultural income generating activities", women used the time for "housework", and "non-agricultural income generating activities." It was therefore confirmed that other working hours increased as an impact of the project by reducing the water fetching labor.

²⁵ Adult (2006) (15 years old or older) literacy rate: 28.3% (Men 36.7% Women 21.0%) Source: Tableau de bord de l'Éducation de Base Année scolaire 2011/2012, Ministère de l'Éducation Nationale et de l'Alphabétisation, Novembre 2012



Source: Beneficiary Survey (Multiple answers by 81 men and 119 women who answered “water fetching time was shortened”)
 Figure 1 Use of Time Obtained by Shortened Water Fetching Time (Men / Women)

For water users who responded that there has been an impact on everyday life of children, the following answers were confirmed (multiple answers allowed). 72.8% answered “time spent at school is increased”, and 65.0% answered “study hours are increased.” Therefore, increase in school hours for children is confirmed as an impact of the project.



Source: Beneficiary survey (246 samples responded that there had been an influence on everyday life of children)

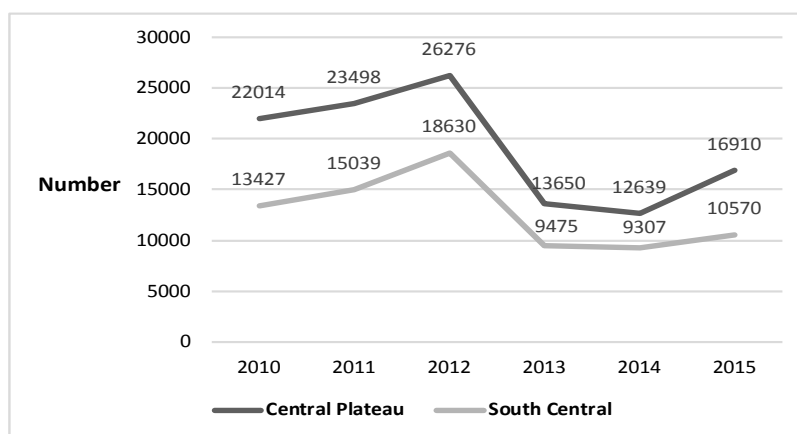
Figure 2 Influence on Everyday Life of Children

3.4.1.2 Dissemination of Hygienic Knowledge

In response to the question regarding change in awareness of hygiene and water use, 100% of the respondents replied that their awareness had “changed”. The changes in actions associated with this awareness as determined from multiple responses included 78.7% “increase in bodily cleanliness”, and “increase in number of times washing”, followed by 64.7% “increase in hand washing”. From this it has been confirmed that activities on hygiene have increased as a result of the change in awareness achieved by the soft components and the increase in water use.

3.4.1.3 Reduction of Water-borne Diseases by Safe Water Supply

According to the interview surveys with Water Supply Sanitation Departments of MEA Regional Offices, in the two target regions of the project water-borne diseases among water users at the target sites were decreased. In the beneficiary survey, 100% of the water users responded that “water-borne diseases are certainly decreased”. According to the annual disease statistics in the two target regions by the Ministry of Health, diarrhea (without melena) was on the rise until 2012 at the time of the project completion and then decreased. After that, it slightly increased or decreased for the year 2013 to 2015.



Source: Annuaire Statistique 2010 -2015, Ministry of Health

Note: No data for 2009 as the Annuaire Statistique 2009 does not include the annual disease statistical data by region.

Figure 3 Annual Transition of Diarrhea in the Two Target Regions

In addition, cholera and guinea-worm disease have not been reported from 2010 to 2015 in the two target regions²⁶. However, it was impossible to obtain quantitative indicators of diarrhea, cholera, and guinea-worm disease only for the water users at the target sites of the project. In terms of the reduction in the risk of water-borne diseases, it is considered that there was a certain effect by the supply of safe water in accordance with the water quality standards, selection of sites where residents’ solidarity is strong, hygienic education by the soft component program, and activities related with hygiene in the technical cooperation project “Project for Enhancement of Water Supply Infrastructure Management and Hygiene and Sanitation in the Region of Central Plateau”²⁷. However, it cannot be said with certainty that there has been a direct cause-and-effect relationship between the project and the reduction in the risk of water-borne diseases.

²⁶ Annuaire Statistique 2010 – 2015, Ministry of Health, Burkina Faso

²⁷ Project Purpose: Management of water supply facilities and hygiene behavior of local people in the target communes are improved.

3.4.2 Other Impacts

3.4.2.1 Impacts on the Natural Environment

According to the questionnaire responses by the implementing agency, there was no negative impact on the environment, such as the occurrence of “lowering of groundwater level,” “land subsidence in the vicinity of the project sites,” or “salinization” in the construction of water supply facilities of the project.

3.4.2.2 Resettlement and Land Acquisition

According to the interviews with the implementing agency and the project consultant, land acquisition for the construction of water supply facilities has been carried out without any problem, with no resettlement of residents.

3.4.2.3 Reducing Negative Impacts by Construction

According to an interview with the project consultant, the construction was carried out with the cooperation of the residents of the villages to minimize traffic disturbance, entering farmland impacts on harvest of agricultural produce, etc., by access to the sites by construction vehicles during facility construction. There were no reported complaints from the residents.

In light of the above, it can be concluded that planned effects were largely achieved. Therefore, the effectiveness and impact of the project are high.

3.5 Sustainability (Rating: ②)

3.5.1 Institutional Aspects of Operation and Maintenance

The implementing agency of the project was the General Directorate of Water Resources (Direction Générale des Ressources en Eau), Ministry of Agriculture, Hydrology and Water Resources at the time of project planning. However, there were reorganizations of ministries four times and restructuring of the General Directorate once, and it became the General Directorate of Drinking Water (Direction Générale de l’Eau Potable, hereinafter referred to as the “DGEP”), Ministry of Water and Sanitation at the time of ex-post evaluation. Although the implementing agency was changed, there was no change in the decision-making process for rural water supply, and there was no affect on the project. The main roles of the DGEP, each administrative agency, and related organizations involved in rural water supply were as shown in Table 11.

Table 11 Roles of Each Organization

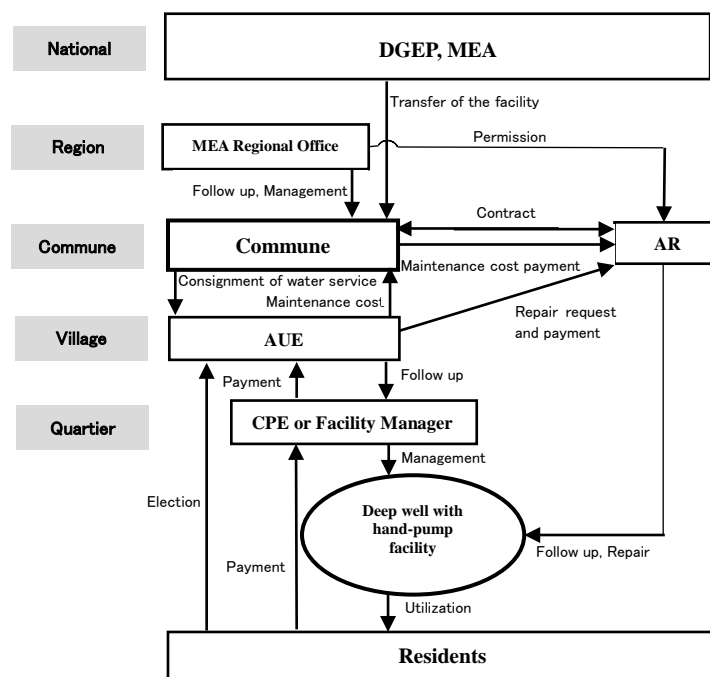
Organization	Main Role
a) DGEP, Ministry of Water and Sanitation	Planning and development of national policies and strategies relating to drinking water supply, and coordination of the establishment of facilities (such as budget securing, donor coordination) and follow-up of the strategy.
b) Water Supply Sanitation Department, Regional Office	Five people including one water conservancy technologist are deployed (the number of personnel for each target region at the time of ex-post evaluation). Development, management and database management of plans are implemented. Also, technical assistance is provided for communes which are the owners of water supply facilities.
c) Water Supply Sanitation Department, Provincial Office (*Not established for provinces in South Central Region)	Project management in the relevant provinces and technical assistance to the commune that is the owner of the water supply facilities are implemented.
d) Commune	The owner of the water supply facilities, and the implementing body of the water supply administration. Communes conduct monitoring of the facility, and conclude an agreement for maintenance and management work with AUEs established in each village.
e) AUE (Water users' association)	AUEs become organizations representing water supply facility users at the village level, and carry out the operation and maintenance of water supply facilities in the form of commissioned work by the commune. AUEs manage water fees collected from water users by the administrator of each well (individuals who have been appointed by the existing CPEs or AUEs), and dispatch ARs (repairers) at the time of failure of water facilities.
f) CPE (Water Facility Site Committee)	CPEs were established for each well and used to do the operation and maintenance of wells before the establishment of AUEs through the REFORME. CPEs also collect water usage fees. Continued existence of CPEs was not prohibited at the time of the ex-post evaluation.
g) Repairers (ARs who are licensed by the regional office of the Ministry of Water and Sanitation)	In the REFORME, repairers enter into contracts with communes to implement inspections twice a year for each well. Also, they are dispatched by AUEs to repair wells in the event of failure.

Source: Answers for the questionnaire and interviews of the Implementing Agency

According to the Burkina Faso side, one or two staff are located at the Water Supply Sanitation Department in each province in Central Plateau Region. On the other hand, there is no staff dispatched to the Water Supply Sanitation Department for the provinces in South Central Region, but the regional office has been supporting the communes.

The REFORME was introduced by “PN-AEPA2015” which was formulated in 2006, in which the system has been changed from the former system of maintenance in well units by CPEs, to a system of maintenance of all wells of a village by AUEs. As a result of the integrated management by the AUEs of the water usage fees for the wells of a village as a whole, the following effects were achieved: 1) the time required for raising the repair expenses when there was a well breakdown was sped up, 2) there was leveling of the water usage fees that previously varied for each well, and 3) a scheme was devised in which even when a well had a problem or was being repaired, it was possible to use another well (as a result of managing the wells in village units).

In accordance with a policy to delegate local authority powers, a government ordinance was proclaimed in the water supply and hygiene field to delegate authority to communes²⁸ in 2009, so the implementing body for water supply projects became the commune. Communes concluded agreements with the AUEs that were established in each village to commission maintenance. In the REFORME, the ARs are guaranteed a certain level of income from their contracts with the communes, and they continuously control multiple wells (maintenance twice a year and minor repairs). Also, when there is a breakdown, the licensed ARs are responsible for repairs based on a request from the AUE, and the AUE pays the AR the repair cost.



Source: Revision of a figure described in the JICA Implementation Review Study Report
Figure 5 Operation and Maintenance System by the REFORME (Level I)

For the spare parts supply system, in addition to spare parts dealers by the pump manufacturing dealers, the maintainer union in each province in Central Plateau Region has been functioning as a spare parts sales base which enables the rapid spare parts supply.

The REFORME is ongoing at the time of ex-post evaluation, and the operation and maintenance system varies by site. According to interviews with the CPE members or former CPE members at the time of site survey, there were several comments such as “dissatisfaction with the fact that much of the money collected by the AUE has been used for wells with high frequency of failure”, “distance and psychological barriers to the use of other wells (other

²⁸ Décret 2009-107/PRES/PM/MATD/MAHRH/MEF/MFPRE du 03 mars 2009 portant transfert des compétences et des ressources de l’Etat aux communes dans les domaines de l’approvisionnement en eau potable et de l’assainissement

quartiers' wells) that are not normally used at the time of well failure”, “insufficient staffing in organizational setup of communes”, and “lack of knowledge and experience relating to the organizational management in the commune”. In 70% or more of the regions where the sites were surveyed, maintenance was carried out in well units by CPEs or their members even though AUEs had been established, so it is considered that the REFORME still has many problems. AUE members are composed of residents in villages and there are cases of former CPE members becoming members of AUEs, however, many AUE members are newly elected and capacity building is essential for them. It should be noted that, since the “Project for Enhancement of Water Supply Infrastructure Management and Hygiene and Sanitation in the Region of Central Plateau” (from June, 2009 to June, 2013), in the targeted Central Plateau Region, AUEs have been established in almost all villages in the region. South Central Region was added to Central Plateau Region as a target area of the “Project for Enhancement of Water Supply Facilities Management and Hygiene and Sanitation in Rural Areas Phase II” that was started in September 2015, however, AUEs have not yet been established in many villages of South Central Region. Even when an AUE establishment has been completed, there are many villages that are having problems such as AUEs not functioning, therefore the technical cooperation project activities will continue to be implemented for preparing the foundation for the REFORME to be disseminated throughout the country²⁹.

As stated above, it is considered that there are some issues regarding the facility operation and maintenance system, such as differences in the rate of progress in establishing the REFORME in each region, and obtaining the understanding of the residents towards the revised system.

3.5.2 Technical Aspects of Operation and Maintenance

In the REFORME, ARs will be in charge of each water supply facility, after entering into a maintenance contract with the respective communes. The number of ARs that obtained the authorization from the regional office of the Ministry of Water is 80 in Central Plateau Region and 63 in South Central Region. However, the number of ARs that have already made a contract with a commune for maintenance is only 35 in Central Plateau Region and only 13 in South Central Region³⁰. It is necessary to promote the conclusion of contracts between communes and ARs. In the project, a 7-day package of training by the Diacfa, which is a manufacturing distributor of the installed pump, was implemented as a soft component activity for ARs to improve their maintenance and repair skills. Furthermore, as a soft component to CPEs, routines for maintenance methods and management of facilities were also introduced.

²⁹ Project Purpose: The establishment of the foundation for nationwide deployment of the REFORME by applying the techniques that were developed in the PROGEA 1st phase. *PROGEA is a name of the technical cooperation project.

³⁰ RAPPORT BILAN NATIONAL DU 1^{ER} SEMESTRE 2016, Juillet 2016

As described above, both ARs and CPE members have sufficient skills to manage the facilities of the project.

In the technical aspects of operation and maintenance, although it is necessary to promote the conclusion of maintenance contracts between communes and ARs, no major problem is seen as the skill level of ARs is high and daily maintenance has been conducted by CPE members.

3.5.3 Financial Aspects of Operation and Maintenance

Table 12 shows the budget for the water sector (excluding the budget for the sanitation sector, and personnel expenses) of the Ministry of Water and Sanitation in charge of the Project.

Table 12 Government Budget relating to the Water Sector Unit: 1,000 FCFA³¹

Budget	2009	2010	2011	2012	2013	2014	2015
Government	6,047,000	6,348,152	4,877,235	7,591,856	9,069,187	8,721,185	3,375,481
From Development Partners*	16,338,947	24,189,603	31,567,395	39,877,559	33,790,621	28,173,457	20,913,704
Total	22,385,947	30,537,755	36,444,630	47,469,415	42,859,808	36,894,642	24,289,185

* Including the sector financial support and the budget for each project and program (funds as a loan program that is intended to enter the national treasury)

Source: General Affairs and Finance Section, Ministry of Water and Sanitation

The budget relating to the water sector for regional offices of the Ministry of Water and Sanitation and communes from the central government is shown in Table 13.

Table 13 Budget of Water Sector for Regional Offices and Communes Unit: 1,000 FCFA

Budget	2009	2010	2011	2012	2013	2014	2015
From Central Government to Regional offices	442,730	3,080,000	8,483,750	11,764,654	13,026,369	10,753,695	8,645,804
From Central Government to Communes	200,000	804,000	2,125,440	2,106,000	2,212,000	2,300,000	666,667

Source: General Affairs and Finance Section, Ministry of Water and Sanitation

As shown in Table 12, 70% to 80% of the budget for the project of the water sector have been covered by the budget from development partners (international organizations such as the AfDB, bilateral aid agencies, etc.). In addition, as shown in Table 13, budget allocation from the central government to regions and communes has been also implemented on the basis of the project budget of development partners. The regional office of the Ministry of Water and Sanitation implements projects by selecting suppliers and consultants to outsource the projects such as facility construction and soft components. However, the budget is not credited to regional offices and the payment to these suppliers and consultants is made from the central government. The budget for communes (subsidy) has been used in the renovation of the

³¹ FCFA is the currency of Burkina Faso. 1FCFA = around 0.18 Japanese Yen (as of June 2016)

existing level I and level II water supply facilities.

As mentioned above, the water sector in Burkina Faso is largely dependent on the funds of development partners. In addition, the operation and maintenance costs of existing rural water supply facilities are borne by water users. According to the results of site survey at the time of field study, the amounts collected as the water usage fee varied depending on the number of water users of the facility³². The site variations were also seen from facility to facility in setting usage fees, such as an additional charge for water use for livestock, an additional amount charged for users that use a large quantity of water for brewing alcoholic drinks, setting charges taking into consideration the status of the agricultural harvest of that year, etc. It should be noted that, according to the beneficiary survey for CPEs, the water usage fee collection rate was 85.9% on average. CPEs or facility managers collect water usage fees from water users of each facility, and pay the AUE the amount of money defined by the respective AUE. If there is a surplus generated, the money is managed by each facility and used for purposes such as maintenance and minor parts replacement. Although water usage fee is collected on a pay-as-you-go basis at some sites, most of the sites conduct a flat rate system because there is no function to measure the quantity of water used by each water user in the facility itself and there is no full-time caretaker at the facility.

In the financial aspects of the operation and maintenance, although no major problem is seen in the current water usage fee collection, it is determined that there are some challenges of financial sustainability. This is because of the high reliance on donor funds and weak financial and personnel systems in the communes, where many of them are still without a department in charge of water supply and sanitation even though they are the implementing body of the rural water supply.

3.5.4 Current Status of Operation and Maintenance

The condition of the facilities was favorable due to cleaning by water users (cleaning within the facilities and prohibition of entering with shoes on, etc.) and tidying up around the facilities (laying sand and gravel and providing hedges). In order to maintain a hygienic environment around the wells, a certain distance (8.5 m) is maintained for the livestock watering place so that livestock do not gather around the wells; thus, no problems regarding hygienic aspect due to livestock were observed. The seepage pits are also installed for final drainage, so that the wastewater seeps underground, and water does not accumulate around the facilities. Although it was not possible to check the inspection and repair records, the operation rates of the facilities are

³² In the interviews during the site survey the most common reply was that the scale of the users is about 300 to 500 users, but some replies indicated 600 or more users. The amount of water usage fees collected varied at each well, the amount being charged in household units, or charged separately for men and women, etc. Common replies regarding the annual water fee in the case of a household was 1,000 FCFA or more, and when charged separately for men and women was 500 to 1,000 FCFA for men and 250 to 500 FCFA for women, etc.

high. Therefore, it is judged that appropriate operation and maintenance is being carried out.

In light of the above, although the current situation of operation and maintenance of the project is favorable, some minor problems have been observed in terms of the future system and the finance status. Therefore, the sustainability of the project effect is fair.

4. Conclusion, Lessons Learned and Recommendations

4.1 Conclusion

The project was implemented for the purpose of contributing to the improvement of the livelihood environment of the residents in the target areas in Burkina Faso, namely, three provinces in Central Plateau Region and three provinces in South Central Region, through reliable access to safe drinking water by constructing deep wells with hand-pump facilities and developing the operation and maintenance system of the facilities.

The project was consistent with the development policies and development needs of Burkina Faso both at the time of project planning and ex-post evaluation. The Japan's ODA policy for Burkina Faso at the time of planning also matched the objective of the project. Therefore, its relevance is high. Although the project cost was within the plan, the project period became longer than planned. Therefore, the efficiency is fair. The target for the population supplied with water by the project that was set at the time of planning was achieved, and the operation rate of constructed deep wells with hand-pump facilities is high. In addition, the amount of water used by the users has increased, and water-borne diseases have been reduced by improving the water quality and the awareness of hygiene. It was also confirmed that women's working hours and children's school hours have been increased through the reduction of water fetching labor. Therefore, the effectiveness and impact of the project are high. There are some problems in the system and the financial condition of the operation and maintenance; thus, sustainability of the project effect is fair.

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

4.2 Recommendations

4.2.1 Recommendations to the Implementing Agency

- Strengthening of staffing and budget allocation to communes, which will be a cornerstone of the REFORME progress

Capacity development plans such as strengthening of staffing and implementing trainings, etc. are an urgent task for the communes as an implementing body of rural water supply projects. Also, it is required to strengthen the allocation of budget to the communes so that personnel of the communes can listen to opinions of residents, visit the sites, and, if necessary, carry out surveys.

- Establishment and implementation of appropriate monitoring and evaluation in relation to AUEs by communes

It is important that the communes promote the REFORME by carrying out monitoring of activities of AUEs that are their contractors, checking the status of collection of water usage fees, dealing with problems such as villages that refuse maintenance activities of water supply facilities by AUEs. When necessary, it is also crucial that the communes visit villages and have discussions with AUEs or village residents, etc.

- Formulation of a communication and advocacy strategy for the REFORME

For the REFORME to be promoted further in the future, it is necessary that a communication strategy for raising the awareness of the residents be formulated in order to widely familiarize the actual water users with its significance and advantages. An advocacy strategy is also required for the leaders and those involved in the communes as implementing bodies of government, so that they will recognize the importance of water supply projects.

4.2.2 Recommendations to JICA

- Implementation of training programs in collaboration with the technical cooperation project relating to the REFORME promotion and facilitating cooperation with the Japan Overseas Cooperation Volunteers (JOCVs)

Along with the technical cooperation projects, implementation of human resource development at the target sites of the project will also contribute to sustainability of the facilities supported by the project. In particular, personnel development has not been carried out for communes, even though they are the implementing body for water supply projects in rural society so it is considered that training based on promotion of the REFORME should be implemented, such as strengthening of management capability, strengthening of mutual learning mechanisms between communes, etc. Also, Japan has been providing assistance in rural water supply not only to Burkina Faso but also to other neighboring countries. Therefore, implementation of a third-country training can be considered for the staff of DGEP and the regional offices as the implementing agency to obtain related knowledge and learn lessons from other countries³³ promoting the same operation and maintenance system. In addition, as stated in the recommendations to the implementing agency, monitoring is

³³ As an example of Tanzania, the formation of the independent residents' operation and maintenance organization from traditional authority such as the village council has been promoted, and water users associations and water user groups by community elections have been formed. In an example of Japanese grant aid project in Tanzania, there is an area where one water management committee implements the operation and maintenance of more than one well with hand-pump facilities. In an example in Senegal, for a level II water facility, operation and management is being implemented by a water management association of which internal regulations or articles of incorporation were created and reported to government agencies by elected committee members. (Source: "Challenges and Lessons Learned from the Operation and Maintenance of Rural Water Supply Facilities in Sub-Saharan Africa" JICA Project Research Report, 2010)

important for promoting the REFORME. However, the REFORME can also be supported by constructing a system (computer program) for collecting information and accumulating indicators, and, dispatching the Japan Overseas Cooperation Volunteers (JOCVs) to raise awareness of the residents on site in accordance with the communication and advocacy strategy. It is considered that this will have the results of contributing to the maintenance of the facilities supported by the project.

4.3 Lessons Learned

Importance of selecting appropriate implementation sites where favorable maintenance will be continued and the operation rate will be high in the future

The facilities supported in the project are well maintained and have high operation rates. This is because evaluation criteria were used in addition to water source and water quality surveys when the target sites were being short-listed from the candidate sites proposed by the Burkina Faso side. The evaluation criteria were the following 10 items; 1. Rate of water supply in the village, 2. Rate of water supply according to quartier, 3. Willingness to pay water usage fees, 4. Health and Hygiene, 5. Distance to water source, 6. Rural society's development priority (development demand from villages for water supply), 7. Operation and maintenance capacity (operation rates for existing hand-pumps), 8. Hydrogeological conditions, 9. Priority of the implementing agency, and 10. Influences on the construction process (access of large vehicles and excavating machinery to villages). Scores were allocated to each of these evaluation items for selecting the sites. Scores³⁴ were weighted down from evaluation item 1, so sites were selected in the order of severe difficulties in water supply (= necessity) or with willingness to pay water usage fees by residents. After the construction, residents would continue maintenance of the facility with ownership, so the operation rate would be high. It is considered that keeping maintenance after construction and operation rates in mind, the selection of the sites for implementation as such will lead to the effectiveness of the project. It is also considered that these evaluation items contribute to the implementation of projects in line with the objectives by taking into consideration the allocation of more points according to the objective of constructing the facility and policy and strategy.

Selection of appropriate management entity of facilities (wells) and capacity building

The facilities supported in the project are well maintained and have high operation rates. One

³⁴ Weighted scoring of each evaluation item is following: 1. Rate of water supply in the village (x10), 2. Rate of water supply according to quartier (x10), 3. Willingness to pay water usage fee (x7), 4. Health and Hygiene (x5), 5. Distance to water source (x5), 6. Rural society's development priority (x4), 7. Operation and maintenance capacity (x4), 8. Hydrogeological conditions (x3), 9. Priority of the implementing agency (x1), 10. Influences on the construction process (x1). Regarding the weighted scoring of "7. Operation and maintenance capacity", it has a slightly lighter scoring as there is a possibility of force majeure even if existing hand-pump is not running, such as well structure, water quality and aging of pumps which are not related with operation and maintenance by residents.

reason for this is considered to be the selection of management entity with a focus on the operation and maintenance system for the constructed water supply facility, and the implementation of the capacity building. In the capacity building of the project, the emphasis was placed on the maintenance of each well, and the establishment of CPEs and strengthening organizations was supported so that maintenance would be firmly implemented for each well. In relation to the maintenance of the rural area water supply facilities in the past, the status of maintenance varied for each well, and, many of the CPEs were dysfunctional, water usage fees were not collected, breakdowns were not dealt with, and there were insufficient awareness on issues on the maintenance system. This was because there was insufficient participation with ownership by the residents when forming the CPEs, and the necessary information and trainings were not provided to those involved, in particular the members of the CPEs. Therefore, in the capacity building, technical support was provided to create motivation in the organizations for operation and maintenance, and to strengthen the organizations when forming the CPEs. It is considered that appropriate selection of management entity and implementation of the capacity building have contributed to the stable operation and maintenance of the facilities.